GROUND WAVE EMERGENCY NETWORK
FINAL OPERATIONAL CAPABILITY

ENVIRONMENTAL ASSESSMENT
FOR
CENTRAL NEVADA RELAY NODE

SITE NO. RN 8W917NV

5 March 1993

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THE GROUND WAVE EMERGENCY NETWORK (GWEN) IS A RADIO COMMUNICATION SYSTEM DESIGNED TO RELAY EMERGENCY MESSAGES BETWEEN STRATEGIC MILITARY AREAS IN THE CONTINENTAL UNITED STATES.

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PREFERRED GWEN SITE REPORT
CENTRAL NEVADA

The U.S. Air Force is proposing to construct a relay node for the Ground Wave Emergency Network (GWEN) in central Nevada. The Air Force has followed the siting process described in Section 5 of the Final Environmental Impact Statement (FEIS) for the Final Operational Capability (FOC) phase of the GWEN program to identify alternative Candidate GWEN Sites (CGSs). The six CGSs identified in central Nevada are referred to as the Bureau of Land Management (BLM)-1, Young, Holland, BLM-2, Renfro, and Rose sites. Subsequent to the field investigation and prior to the sites specific studies, the owner of the Renfro site withdrew his land from further consideration. However, the Air Force has made the decision to evaluate and publish the data already gathered on that site as well as the other five sites.

This report summarizes the process of selecting the preferred site from the six CGSs. This PGSR, along with a site-specific Environmental Assessment (EA) and Finding of No Significant Impact (FONSI), is being distributed for information and comment in compliance with the Air Force's process of Interagency and Intergovernmental Coordination for Environmental Planning (IICEP).

Operational, environmental, and developmental suitability; construction and real estate acquisition costs; and public comments and concerns are all factors which have been considered in arriving at the selection of the preferred site.

Without an **operationally suitable** location, connectivity of the relay node in central Nevada to the GWEN network cannot be achieved. Ground conductivity measurements are acceptable at all six CGSs. During the site-specific studies, no radio frequency interference was detected in the GWEN frequency bands which would interfere with the operation of the GWEN receiver. Due to the short distance to power carrier lines, the Holland site is marginally preferred.

The next major factor considered in the selection of the preferred site was **environmental suitability**. The environmental suitability of each CGS was determined from information provided by an independent field analysis and is documented in the EA. The Renfro site was withdrawn prior to the environmental studies. The EA for the remaining five CGSs was completed in March 1993. The environmental analysis found that construction of a GWEN relay node at the BLM-1, Young, Holland, BLM-2, and Rose sites will have no significant environmental impact. A FONSI for these five sites was completed on 6 April 1993. Thus, five of the six CGSs are environmentally suitable, but none of these five are environmentally favored over the others.

All six CGSs are **suitable for development** as a GWEN relay node. The FAA has approved construction of the GWEN relay node at any of the six CGSs. **Construction cost** is also a consideration in the selection of the preferred site. Construction costs for the two BLM sites are slightly more than the other three sites with the BLM-1 site being the cheaper of the two. The construction costs at the other three sites are below average and not significantly different. All six sites are developmentally suitable and construction cost are acceptable.

Real estate negotiations have been completed for the purchase of the Holland and Rose sites and the purchase or lease of the Young site. A no cost right-of-way release would be issued if the site were constructed on either of the two BLM sites. The

owner of the Renfro site announced his desire to withdraw from consideration during negotiations. Because the right-of-way release is no cost, the BLM sites are favored.

With operational, environmental, and developmental factors evaluated and acquisition and construction costs considered, the Air Force prefers the BLM-1 site. The BLM-1 site is preferred because it is operationally, environmentally, and developmentally suitable and is the least expensive site to develop of the BLM properties and will cost nothing to acquire.

I have therefore selected the BLM-1 site as the Air Force's preferred site for development as the GWEN relay node in central Nevada. After reviewing the information received during the IICEP process, I will direct the final land acquisition activities and construction of the GWEN relay node.

STEPHEN T. MARTIN, LT COL,
Program Manager, GWEN

12 April 93
(Date)

FINDING OF NO SIGNIFICANT IMPACT

NAME OF ACTION: GROUND WAVE EMERGENCY NETWORK
CENTRAL NEVADA RELAY NODE

DESCRIPTION OF PROPOSED ACTION ALTERNATIVES:

The U.S. Air Force plans to construct a radio communications relay node in central Nevada (Lander County) as part of the Ground Wave Emergency Network (GWEN) communications system. Six action alternatives associated with six candidate GWEN sites (CGSs) in central Nevada and the no action alternative have been considered and evaluated in an environmental assessment (EA).

GWEN is a radio communications system designed to relay emergency messages between strategic military areas in the continental United States. The system is immune to the effects of high-altitude electromagnetic pulse (HEMP) energy surges caused by nuclear detonations in the ionosphere that would disrupt conventional communications equipment. A failure of such equipment would prevent timely communications among top military and civilian leaders and strategic Air Force locations and prevent U.S. assessment and retaliation during an attack. GWEN is an essential part of a defense modernization program to upgrade and improve our nation's communications system, thereby strengthening deterrence.

The GWEN system is a network of relay nodes, receive-only stations, and input/output stations. The relay node in central Nevada would be part of the Final Operational Capability (FOC) phase of the GWEN system and would establish essential links with adjacent nodes in the network.

In September 1987, the U.S. Air Force Electronic Systems Division, Hanscom Air Force Base, Massachusetts published a Final Environmental Impact Statement (FEIS) for the GWEN FOC that addressed the system as a whole and identified expected environmental effects common to all sites. Section 5 of the FEIS described a siting process that is designed to minimize the potential for environmental impacts. This process has three distinct phases: network definition, regional screening, and individual site evaluation. Network definition identified the need for a relay node in central Nevada. Regional screening resulted in the identification of six CGSs in central Nevada that met the exclusionary and evaluative criteria described in that FEIS. Individual site evaluation examined the relative suitability of the CGSs through site-specific technical studies. The EA is a part of the third phase and is tiered from that FEIS. It addresses the potential environmental effects of the six action alternatives and the no action alternative.

The proposed relay node in central Nevada will be an unmanned facility located on approximately 11 acres of land and, once constructed, will resemble an AM radio broadcast station. The facility will consist of a 299-foot-tall, low-frequency (LF) transmitter tower, three equipment shelters, an access road, and associated fences. The tower will be supported by 24 guy wires, including 12 top-loading elements. An equipment shelter at the tower base will contain an antenna tuning unit. An 8-foot-high chain link fence topped with barbed wire will surround the tower base and associated equipment shelter. A radial ground plane, composed of 100, 0.128-inch-diameter copper wires buried about 12 inches underground, will extend out about 330 feet from the tower base. A 4-foot-high fence will be installed around the perimeter of the copper radials.

A second equipment area located at the site perimeter will contain two shelters housing a back-up power group (BUPG) with two internal fuel storage tanks and radio processing equipment. The BUPG will operate during power outages and for testing purposes. An LF receive antenna, consisting of a pair of 4-foot-diameter rings mounted on a 10-foot pole, and an ultrahigh-frequency (UHF) antenna, used for communicating with airborne input/output terminals and consisting of a 9-foot-high whip-like antenna mounted on a 30-foot-high pole, will also be located in this area. An 8-foot-high chain link fence topped with barbed wire will enclose the entire equipment area. A 10-foot-wide gravel road will connect this area to the tower base. A 12-foot-wide gravel road will provide access to the site from a public road.

The station will use existing commercial three-phase electric power and telephone service. Power and telephone service will be brought to the site through either overhead or buried lines, depending on local utility practices. In its ready status, the antenna will transmit in the LF radio band at 150 to 175 kilohertz for a total of 6 to 8 seconds per hour.

Five of the six action alternatives are discussed in this Finding of No Significant Impact (FONSI). Because the Renfro site (CGS-15) was withdrawn prior to the archaeological survey, impacts to archaeological resources are unknown; it will therefore not be considered in this FONSI.

ANTICIPATED ENVIRONMENTAL EFFECTS

The EA evaluated potential impacts to the physical, biological, and socio-cultural environment from construction and operation of the relay node.

The project would have no significant impacts on physical resources. Erosion and increased runoff would be minimized by using proper erosion control techniques during construction. Sites currently in agricultural use will be replanted after construction; sites with desert vegetation will be restored to preexisting natural conditions. Impacts to mineral resources would be minor. Paleontological resources are not likely to occur on any of the sites; therefore significant impacts to them are not anticipated. No prime farmland would be removed from production. Water quality would not be significantly affected because increases in copper concentrations due to corrosion of the ground plane would be negligible. Air quality would not be significantly affected. During construction, temporary and insignificant increases in emissions would occur, and during operation, emissions from the BUPG would not be sufficient to result in violation of air quality standards.

The project would have no significant impacts on biological resources. The sites are located on agricultural fields or rangeland and do not contain sensitive wildlife habitat. The sites are not within 300 feet of wetlands, nor are they within a 100-year floodplain. Informal consultation with the U.S. Fish and Wildlife Service indicated that the project would not affect any threatened or endangered species. The Nevada Natural Heritage Program indicated that no state-listed rare, threatened, or endangered species or unique biological communities are known to occur on any of the sites. Bird-tower collisions may occur but would not be significant because the tower would be located away from primary bird habitats and migration routes.

The project would have no significant impacts on socio-cultural resources. Construction would have a small, beneficial impact on the local economy, in part by providing temporary employment for contractors and construction workers. Community support systems would not be significantly affected. Land use and noise impacts would not be significant. The relay node signal would not interfere with commercial television or radio broadcasts, amateur radio operations, garage door openers, or pacemakers. Radio-frequency emissions outside the fenced area around the tower base would not pose a health hazard to humans or animals. The Nevada Department of Conservation and Natural Resources, Division of Historic Preservation and Archeology was consulted and has concurred that the project would not affect significant cultural resources. Significant impacts to Native American traditional, religious or sacred sites are not anticipated. A visual analysis conducted in accordance with the criteria developed in the FOC FEIS concluded that the relay node facility would not cause significant visual impacts.

CONCLUSIONS:

No significant impacts to the surrounding environment would be caused by construction and operation of the proposed relay node on the BLM 1 (CGS-2), Young (CGS-3), Holland (CGS-6), BLM 2 (CGS-12), or Rose (CGS-16) site. Therefore, an environmental impact statement for a GWEN relay node at the cited locations in central Nevada is not required.

Robert A. Zongol
Chairman
HQ ESC Environmental Protection Committee

6 Apr 95
Date

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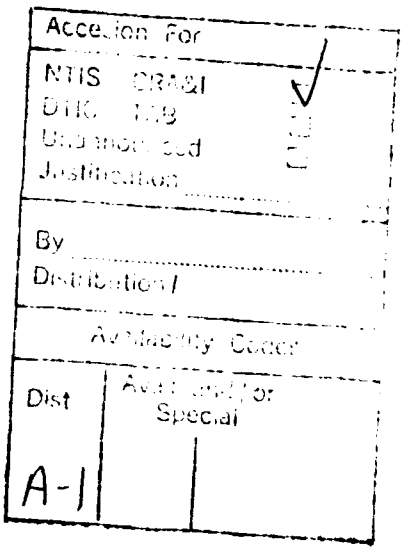

5 March 1993

Electronic Systems Center
Air Force Material Command, USAF
Hanscom AFB, Massachusetts 01731-1623

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SUMMARY

The Ground Wave Emergency Network (GWEN) is a radio communication system designed to relay emergency messages between strategic military areas in the continental United States. The system is immune to the effects of high-altitude electromagnetic pulse (HEMP) energy surges caused by nuclear bursts in the ionosphere that would disrupt conventional communications equipment such as telephones and shortwave radios. A failure of such equipment would prevent timely communications among top military and civilian leaders and strategic Air Force locations and prevent U.S. assessment and retaliation during an attack. GWEN is an essential part of a defense modernization program to upgrade and improve our nation's communications system, thereby strengthening deterrence.

The GWEN system consists of a network of relay nodes, receive-only stations, and input/output stations. Each relay node, such as the one proposed in central Nevada, consists of a guyed radio tower facility similar to those used by commercial AM broadcast transmitters.

A Final Environmental Impact Statement (FEIS) for the GWEN Final Operational Capability (FOC) was published in September 1987 by the Electronic Systems Division, Hanscom Air Force Base, Massachusetts. That FEIS addressed the GWEN system as a whole, identifying expected environmental effects common to all sites. Section 5, beginning on page 5-1 of the FEIS, describes a siting process that is designed to minimize the potential for environmental impacts. This process has three distinct phases: network definition, regional screening, and individual site evaluation.

Phase 1, network definition, identified the geographic coordinates that met the operational needs and technical constraints of the network. Each set of coordinates became the center of a circular site search area (SSA) with a 9-mile radius (250 square miles). The SSA discussed in this Environmental Assessment (EA) was centered approximately 8 miles southwest of the town of Austin in Lander County, in central Nevada, at latitude 39.43° N and longitude 117.20° W. The principal town in the SSA is Austin.

Phase 2, regional screening, involved the application of exclusionary and evaluative criteria to the SSA to avoid environmentally sensitive areas. The remaining areas, called potential areawide sites (PAWS), became the focus of the siting process. A field investigation for central Nevada was conducted in January 1990. Sixteen sites were identified during automobile-based surveys as potential candidate GWEN sites (PCGSs). All PCGSs were located in Lander County. Attempts were made to contact the owners of the sites to determine their interest in selling or leasing land to the Government. Rights-of-entry were granted to allow the field team to investigate eight PCGSs. Four additional PCGSs were Bureau of Land Management (BLM) land and did not require rights-of-entry. Following evaluation against the environmental criteria set forth in the FEIS, six PCGSs were recommended as candidate GWEN sites (CGSs) for further review. These CGSs were described in the Preliminary Site Evaluation Report (PSER) of April 5, 1990.

Subsequent to the PSER being issued, and the majority of the site-specific studies being accomplished, a CGS landowner withdrew one site from consideration (Renfro, CGS-15). This landowner is no longer interested in leasing or selling land to the Air Force. However, since the site-specific studies, except for the archaeological study, had been accomplished on this site prior to the owner's withdrawal, and because this site continues to be considered as a viable alternative, the Air Force has presented this data on the withdrawn site in this EA.

Phase 3, individual site evaluation, involves evaluating the relative suitability of the candidate sites through site-specific technical studies. This EA is a product of those evaluations and discusses the six siting alternatives in central Nevada. It addresses only those criteria that apply to the candidate sites. The seventh alternative, no action, would impair performance of the GWEN system but leave the environment unchanged.

To be suitable for construction and operation, a site should measure at least 700 by 700 feet (approximately 11 acres), be relatively level and undeveloped, be free of natural or man-made obstructions, and have soils capable of supporting relay node structures. The site should also be close to all-weather roads, commercial three-phase power, and telephone lines to minimize costs. To operate effectively, the site must be located at least

a minimum distance from obstructions that could affect reception and transmission. These include buildings and towers, high-voltage power lines, and other communications systems or sources of radio-frequency interference. Specific minimum distances depend on height and power levels of identified obstructions or interfering sources.

Impacts to archaeological resources are unknown on the Renfro site (CGS-15) because the site was withdrawn before the archaeological survey was undertaken.

This EA shows that construction and operation of a GWEN relay node on the BLM 1 (CGS-2), Young (CGS-3), Holland (CGS-6), BLM 2 (CGS-12), or Rose (CGS-16) site would have no significant impacts. During the 6-week construction period, the project would cause temporary and insignificant air quality and noise impacts and slight increases in traffic. It would have a small, beneficial impact on the local economy, in part because it would provide temporary employment for contractors and construction workers. If built on any of the above sites, the project would have no significant impacts on air quality; water quality; land use; mineral resources; known paleontological resources; biological resources, including threatened and endangered species; or cultural resources that are listed, eligible, or potentially eligible for listing on the National Register of Historic Places. Visual impacts would not be significant. Radio-frequency emissions outside the fenced area around the tower base would not pose a health hazard to humans or animals.

1.0 PURPOSE AND NEED FOR ACTION

The proposed action covered by this Environmental Assessment (EA) includes construction and operation of a relay node of the Ground Wave Emergency Network (GWEN) in central Nevada (see Figure 1.1 of this EA). This relay node will provide essential connections with adjacent nodes in the network. The major features of a GWEN relay node and associated environmental impacts common to all sites are addressed in the Final Environmental Impact Statement (FEIS) for the Final Operational Capability (FOC) phase of GWEN, which was published in September 1987 by the Electronic Systems Division, Hanscom Air Force Base, Massachusetts. This EA is tiered from that FEIS and addresses site-specific conditions at the candidate GWEN sites (CGSs) for this particular site search area (SSA).

The purpose of GWEN is to provide to the President and the National Command Authority a strategic communications network that is immune to the effects of high-altitude electromagnetic pulse (HEMP) and will carry critical attack warning and force execution data. As a result, GWEN will remove any possibility of potential aggressors taking advantage of the electromagnetic pulse generated by a high-altitude nuclear burst. A HEMP surge would disrupt the nation's electric power line transmission capability, cripple electronic devices, and adversely affect skywave communications networks based on conventional electronics. GWEN provides a low-frequency (LF) ground wave communication network that will not be affected by HEMP effects. It thereby strengthens deterrence by removing the option of beginning an attack against the United States by using HEMP effects.

A partial GWEN network, called the Thin Line Connectivity Capability (TLCC), has been completed. It contains 8 input/output stations, 30 receive-only stations, and 54 relay nodes. The TLCC provides a limited level of HEMP-protected communications to strategic forces and the National Command Authority.

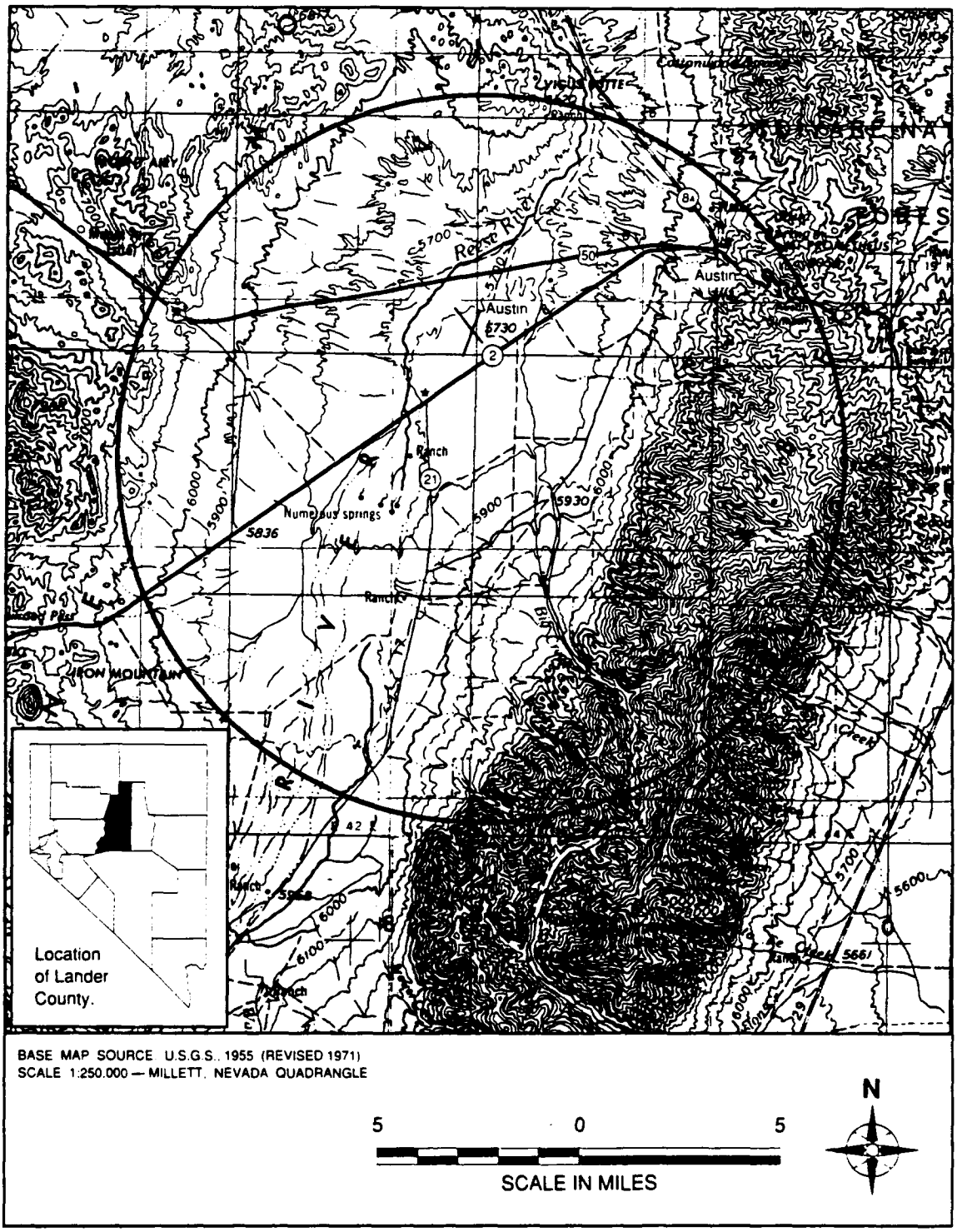

FIGURE 1.1 CENTRAL NEVADA SITE SEARCH AREA (SSA), LANDER COUNTY, NEVADA

The FOC phase of GWEN will add 29 relay nodes. The FOC will allow communication along several routes, thereby enhancing system availability and ensuring that vital communications will be maintained.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

The six action alternatives are site-specific applications of the standard relay node design presented in the FEIS. Consequently, they share a number of features that are discussed in Section 2.1 of this EA. The site-specific features are discussed in Sections 2.2 through 2.7 of this EA. Site descriptive data was obtained during field investigations conducted in January 1990. Figure 2.1 of this EA shows the six CGSs in relation to the major features of the SSA. Figure 2.2 and Appendix B of this EA show the locations of the CGSs in relation to roads and surrounding topography, respectively.

2.1 Common Features of the Action Alternatives

2.1.1 Site Selection Process

The process used to select sites is described in Section 5, beginning on page 5-1 of the FEIS. This process has three distinct phases: network definition, regional screening, and individual site evaluation. Appendix A of this EA provides a diagram of the site selection process. The environmental criteria used in this process are defined in Tables 5-1 and 5-2, pages 5-7 through 5-14 of the FEIS.

Phase 1, network definition, involved locating network nodes to optimize their performance while serving a predetermined number of users. A typical GWEN ground wave has an effective range of about 150 to 200 miles. Thus, relay nodes could not be located independently; changing the location of one would affect the connectivity with other nodes in the network. Once the optimal coordinates of the relay nodes were identified, a 9-mile-radius SSA was defined around each point to provide suitable opportunity for siting a relay node near that point. The 9-mile radius was chosen because it provided a reasonably sized search area consistent with the technical constraints on the relay node. If a significant portion of an SSA fell within an environmentally highly sensitive area such as a national park or wilderness area, an alternative was selected and its connectivity evaluated. This process was repeated until all relay nodes fell outside such areas.

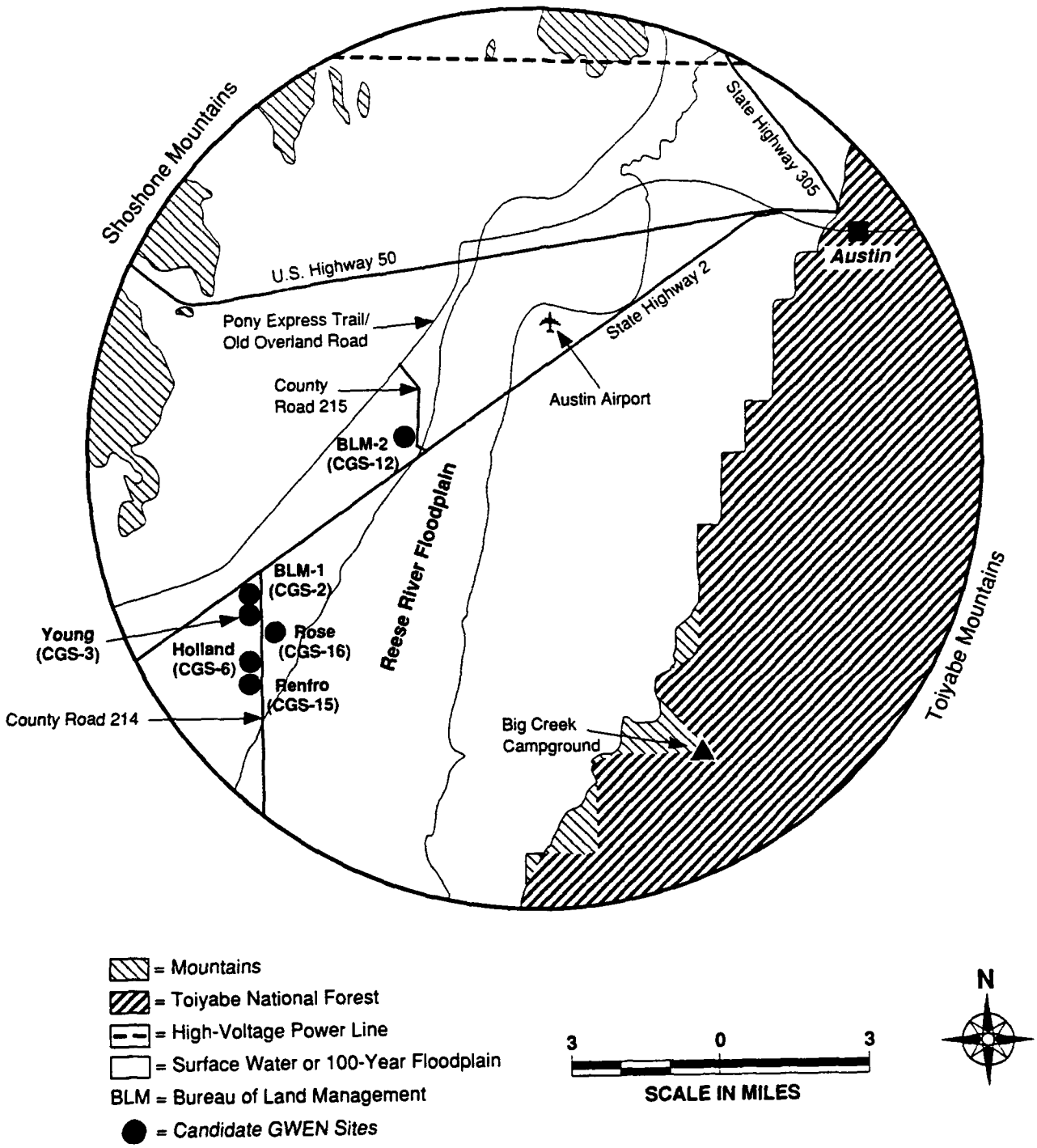

FIGURE 2.1 LOCATIONS OF CANDIDATE GWEN SITES (CGSs) RELATIVE TO SELECTED MAJOR FEATURES AND ROADS WITHIN THE CENTRAL NEVADA SITE SEARCH AREA

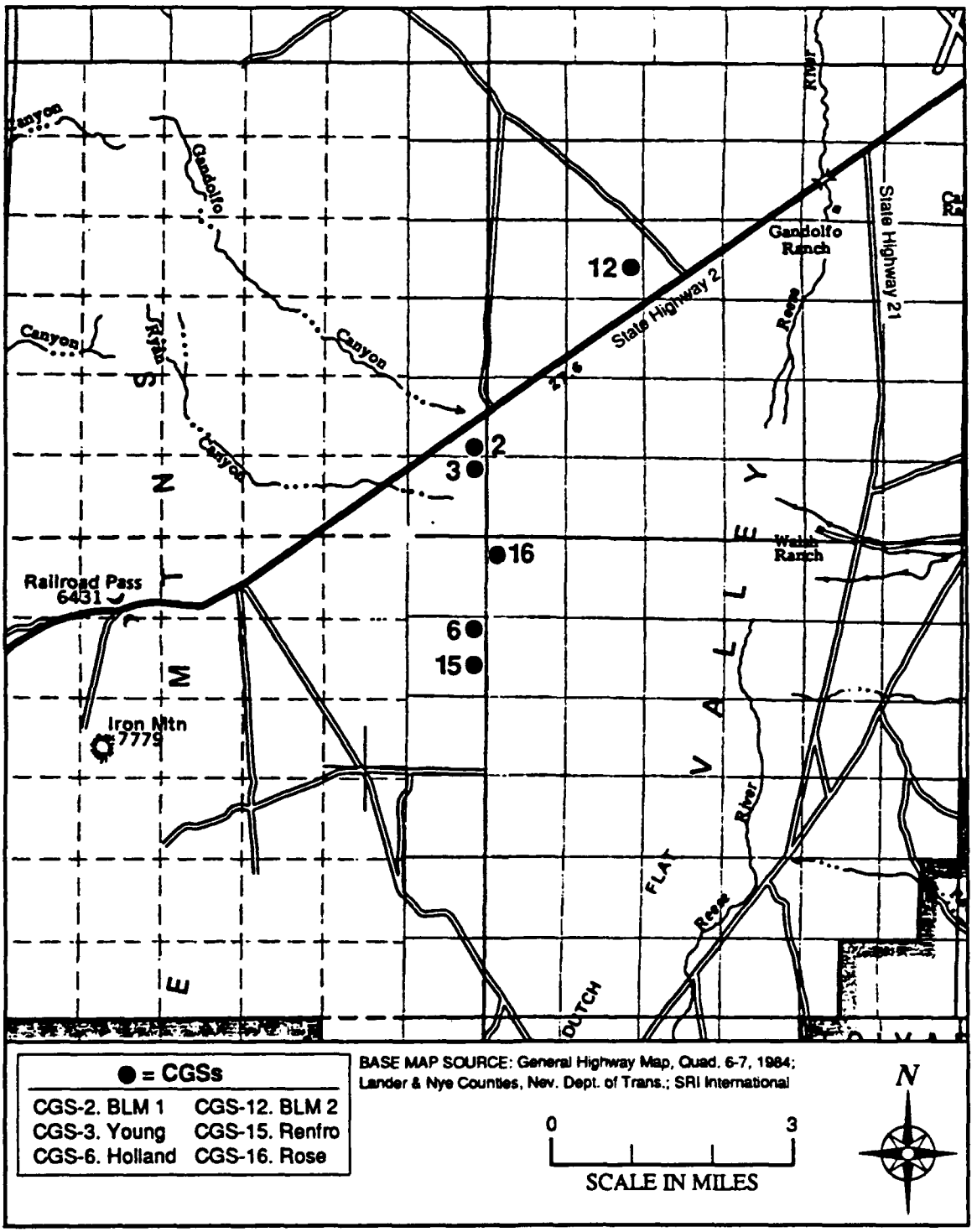

FIGURE 2.2 LOCATIONS OF CANDIDATE GWEN SITES (CGSs) IN LANDER COUNTY

Phase 2, regional screening, involved the application of exclusionary and evaluative criteria to the SSA to identify areas that might contain operationally acceptable sites outside environmentally sensitive areas. The resulting search areas, called potential areawide sites (PAWS), were submitted to appropriate federal, state, and local officials for review. The PAWS were then redefined, as appropriate, by incorporation of the comments of the reviewers, and a field investigation was conducted to find suitable candidate sites for a GWEN relay node within the redefined PAWS.

The field investigation for central Nevada was conducted in January 1990. Sixteen sites were identified during automobile-based surveys as potential candidate GWEN sites (PCGSs). Attempts were made to contact the owners of the sites to determine their interest in selling or leasing land to the Government. Rights-of-entry were granted to investigate eight PCGSs. Four additional PCGSs were Bureau of Land Management (BLM) land and did not require rights-of-entry. Following evaluation against the environmental siting criteria set forth in the FEIS, six of the twelve PCGSs were recommended as CGSs for further review.

Subsequent to the PSER being issued, and the majority of the site-specific studies being accomplished, a CGS landowner withdrew one site from consideration (Renfro, CGS-15). This landowner is no longer interested in leasing or selling land to the Air Force. However, since the site-specific studies, except for the archaeological study, had been accomplished on this site prior to the owner's withdrawal, and because this site continues to be considered as a viable alternative, the Air Force has presented this data on the withdrawn site in this EA.

Phase 3, individual site evaluation, of which this EA is a part, is then used to determine the relative suitability of the candidate sites through site-specific technical studies. This EA presents the results of the environmental portions of those studies and covers site-specific impacts associated with construction of a relay node in central Nevada. These are summarized in Sections 4.2 through 4.7 of this EA. The findings of this EA and site-specific studies of operational parameters will be used to select a preferred GWEN site (PGS).

2.1.2 Relay Node Construction and Operation

A typical relay node site is located on approximately 11 acres of land (see Figure 2.3 of this EA). It is an unmanned facility consisting of a 299-foot-tall, three-sided, 2-foot-wide LF transmitter tower, three equipment shelters, an access road, and associated fences. The tower has a base insulator and lightning protection and is supported by 24 guy wires, including 12 top-loading elements to further strengthen the signal and provide additional structural support. These guy wires and top-loading elements are attached to the tower and 18 buried concrete anchors. The sizes of these anchors and their depth of burial varies with local soil and bedrock properties. However, the guy-wire anchors typically are rectangular blocks buried 5 feet below the surface. If bedrock occurs at or near the surface, the anchors are special rock-embedded rods. The tower base is concrete with a cross-section area resembling an inverted T. The size of this foundation is determined by soil conditions.

A radial ground plane, composed of 100 buried copper wires, extends out from the base of the tower. Each wire is 0.128 inch in diameter, about 330 feet long, and buried approximately 12 inches underground. The ground plane helps to strengthen the broadcast signal, and the number and length of the wires depend on the soil conductivity at the site. A 4-foot-high fence is installed around the perimeter of the ground plane to protect the ground plane and guy anchors and to prevent inadvertent exposure to electric shock resulting from the buildup of static electric charge.

In addition to the main tower, the relay node has two other antennas. One is an LF receive antenna made up of a pair of 4-foot-diameter rings mounted on a 10-foot pole. The second is an ultrahigh-frequency (UHF) antenna used for communicating with airborne input/output terminals. It is a 9-foot-high whip-like antenna mounted on a 30-foot-high pole. Both antennas are located within the equipment area at the perimeter of the site, which is enclosed by an 8-foot-high fence.

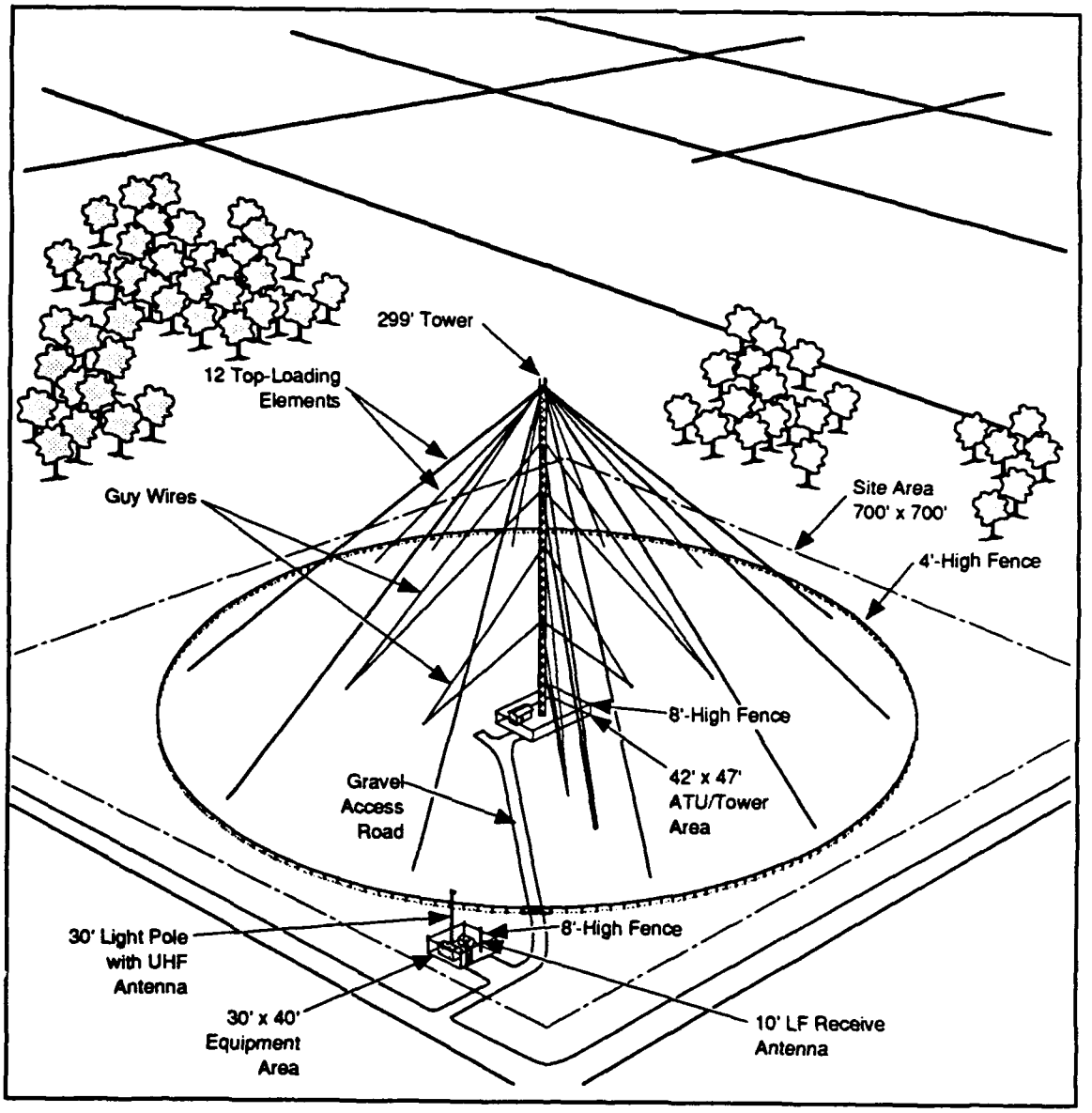

FIGURE 2.3 TYPICAL LAYOUT OF FOC RELAY NODE STATION

The siting and design of the tower are coordinated with the Federal Aviation Administration (FAA) to ensure compliance with FAA standards and regulations. The tower is equipped with a white strobe light at the top, which emits 40 flashes per minute and is rated at 20,000 candelas for daytime and twilight use and 2,000 candelas for nighttime use. To minimize glare at ground level, the light is focused upward and horizontally outward.

GWEN operates intermittently in the LF radio band at 150 to 175 kilohertz (kHz). For comparison, the low end of the AM band for commercial broadcasts is 530 kHz. The peak broadcast power for each GWEN tower is from 2,000 to 3,000 watts, depending on local soil conditions. In its ready status, GWEN typically transmits for a total of 6 to 8 seconds per hour. GWEN does not interfere with commercial television, radio broadcasts, amateur radio operations, garage door openers, or pacemakers, as noted in Section 2.1.1.1, page 2-3 of the FEIS.

All equipment shelters are anchored to concrete pads. One shelter, located at the base of the tower, houses the antenna tuning unit (ATU). Two other shelters are located side by side in the equipment area enclosed at the perimeter of the property. One houses radio-processing equipment, and the other houses a 70-horsepower, back-up diesel generator and two aboveground fuel tanks. The generator operates 2 hours per week for testing purposes and during power outages. Locked, 8-foot-high chain link fences topped with barbed wire secure the equipment shelter areas at the base of the tower and at the perimeter of the site to provide safety and to inhibit unauthorized entry. A 12-foot-wide gravel road provides access to the equipment area enclosure at the perimeter of the property. A 10-foot-wide gravel road leads from the equipment enclosure to the tower.

Fuel is stored in two aboveground steel tanks inside the generator shelter. Tank capacities are 559 gallons and 461 gallons. Each tank pipes fuel separately to the back-up power group (BUPG) and is equipped with two outlet shut-off valves, one controlled manually and one controlled automatically. If a leak occurs, fuel will flow into a floor drain leading to a tightly capped pipe extending outside the BUPG.

Once approximately 2 gallons of fuel accumulate in the pipe, a "liquid spill" signal is sent to the GWEN Maintenance Notification Center, which will dispatch maintenance personnel.

However, if a leak were not detected, an explosion inside the shelter would be extremely unlikely due to the high flash point of diesel fuel. If a tank at the GWEN station failed, the entire contents of one tank could be released and contained inside the BUPG shelter. Refer to Section 4.12.1.1, beginning on page 4.12-1 of the FEIS for further discussion on diesel fuel spills and leaks.

The station uses existing commercial three-phase electric power and telephone service, but does not require water, septic, or sewer systems. Power and telephone service are brought to the site through either overhead or buried lines depending on local utility practices. Power and telephone service are generally brought underground from the site boundary to the equipment shelter area.

Temporary increases in air pollutant emissions will occur during construction, primarily from greater use of heavy machinery than is required in normal farming operations. Emissions resulting from operations of the facility will be limited to the operation of the BUPG, which will operate only 2 hours every week for testing purposes and for additional periods as required during power outages. Thus, the generator will operate for a total of 152 hours per year, if commercial power outages totaled 48 hours. If the generator runs at 100 percent load during the projected 152-hour operating time, total emissions in one year will be less than 350 pounds per pollutant, as documented in Section 4.3.1, beginning on page 4.3-1 of the FEIS.

Noise levels generated by construction equipment are discussed in Section 4.5.1.1, beginning on page 4.5-1 of the FEIS. Under worst-case assumptions, levels could reach 78 dBA at the site boundary from on-site activity and 92 dBA at distances of 50 feet from equipment installing the off-site access road. Noise generated during GWEN operation would come from the BUPG, which will operate only 2 hours per week and during commercial power outages. The BUPG will be located at least 50 feet within the site boundary with its exhaust side oriented toward the tower area. Noise levels due to intermittent operation of the BUPG will be less than 72 dBA at the site boundary, which is within the standards typically set for lands under agricultural use (70 to 75 dBA). At 50 feet beyond the site boundary, the noise level would drop below 65 dBA, which is within the standards typically set for residential and mixed residential/agricultural use (55 to 65 dBA).

These noise levels and standards are discussed in Section 3.5.3, page 3.5-2 and Section 4.5.1, pages 4.5-1 through 4.5-6 of the FEIS.

Construction will require as many as 20 workers at any given time and take about 6 weeks. Standard earth-moving and erection equipment will be used, as detailed in Table 2-1, page 2-14 of the FEIS. Erosion control techniques that are consistent with local practices will be used during construction. Vegetation removal and grading at all of the sites will be minimal. Sites currently in agricultural use will be replanted after construction is finished; sites with desert vegetation will be restored to preexisting natural vegetation.

After construction is completed, personnel requirements will be limited to periodic maintenance by a contractor who will service the equipment, cut the surface growth, remove snow from the access road, and perform other services, as needed. Security services will be arranged with local authorities. The projected life of the facility is 15 to 25 years. Upon decommissioning, the tower and other structures will be removed, as discussed in Section 2.1.4, page 2-18 of the FEIS.

2.2 Alternative 1: BLM 1 Site (CGS-2)

The BLM 1 site is 15 feet west of County Road 214 in the southeast quarter of the southeast quarter (SE1/4 SE1/4) of Section 25, Township 18N, Range 41E, in Lander County. The site is 14 feet north of a private, gravel road, and approximately 0.25 mile south of the intersection of State Highway 2 (Old Route 50) and County Road 214, a 20-foot-wide, paved road maintained by the county. Access would be from County Road 214 to the southeast corner of the site; 15 feet of road would be required.

Three-phase power would be obtained from overhead lines 50 feet from the eastern site boundary, on the east side of County Road 214. Telephone lines would be connected to an underground cable approximately 50 feet from the eastern site boundary, also on the east side of County Road 214.

Appendix B, Figure B.1 of this EA, provides a map showing the surrounding topography.

2.3 Alternative 2: Young Site (CGS-3)

The Young site is 15 feet west of County Road 214 in the NE1/4 NE1/4 of Section 36, Township 18N, Range 41E, Lander County. The site is 14 feet south of a private, gravel road and approximately 0.4 mile south of the intersection of State Highway 2 and County Road 214, a 20-foot-wide all-weather road maintained by the county. Access would be from County Road 214 to the northeast corner of the site; 15 feet of road would be required.

Three-phase power would be obtained from overhead lines along the gravel road adjacent to the northern site boundary. Telephone lines would be connected to an underground cable 50 feet from the site, on the east side of County Road 214.

Appendix B, Figure B.2 of this EA, provides a map showing the surrounding topography.

2.4 Alternative 3: Holland Site (CGS-6)

The Holland site is 23 feet west of County Road 214 in the NE1/4 NE1/4 of Section 1 of Township 17N, Range 41E, Lander County. The site is 1.5 miles south of the intersection of State Highway 2 and County Road 214, a 20-foot-wide, all-weather road. Access would be from County Road 214 to the northeast corner of the site; 23 feet of road would be required.

Three-phase power would be obtained from overhead lines 86 feet from the eastern site boundary, east of County Road 214. Telephone lines would be connected to an underground cable 86 feet from the site, also east of County Road 214.

Appendix B, Figure B.3 of this EA, provides a map showing the surrounding topography.

2.5 Alternative 4: BLM 2 Site (CGS-12)

The BLM 2 site is 22 feet west of County Road 215 in the NE1/4 SE1/4 of Section 17, Township 18N, Range 42E, Lander County. The site is 0.4 mile north of the intersection of

State Highway 2 and County Road 215, a 15-foot-wide, all-weather road. Access would be from County Road 215 to the southeast corner of the site; 22 feet of road would be required.

Three-phase power would be obtained from overhead lines approximately 0.4 mile northeast of the site, on the east side of County Road 215. Telephone lines would be connected to an underground cable adjacent to the eastern site boundary.

Appendix B, Figure B.4 of this EA, provides a map showing the surrounding topography.

2.6 Alternative 5: Renfro Site (CGS-15)

The Renfro site is 27 feet west of County Road 214 in the NE1/4 SE1/4 of Section 1, Township 17N, Range 41E, Lander County. The site is 2 miles south of the intersection of State Highway 2 and County Road 214, a 20-foot-wide, all-weather road. Access would be from County Road 214 into the northeast corner of the site; 27 feet of road would be required.

Three-phase power would be obtained from overhead lines adjacent to the northern site boundary. Telephone lines would be connected to an underground cable 67 feet east of the site, on the east side of County Road 214.

Appendix B, Figure B.5 of this EA, provides a map showing the surrounding topography.

2.7 Alternative 6: Rose Site (CGS-16)

The Rose site is 65 feet east of County Road 214 in the NW1/4 SW1/4 of Section 31, Township 18N, Range 42E, Lander County. The site is located 1 mile south of the intersection of State Highway 2 and County Road 214, a 20-foot-wide, all-weather road. Access would be from County Road 214 into the northwest corner of the site; 65 feet of road would be required.

Three-phase power would be obtained from overhead lines 50 feet from the western site boundary, along the east side of County Road 214. Telephone lines would be connected to an underground cable which is 50 feet from the site along the east side of County Road 214.

Appendix B, Figure B.6 of this EA, provides a map showing the surrounding topography.

2.8 No Action Alternative

The no action alternative is deletion of the central Nevada relay node from the GWEN network. Adoption of this alternative would mean a consequent degradation in the performance of the system, due to a lack of connectivity to other nodes in the system.

3.0 AFFECTED ENVIRONMENT

This section discusses the environmental setting of the proposed GWEN project in central Nevada. Section 3.1 of this EA describes the general characteristics of the SSA, and Sections 3.2 through 3.7 of this EA describe the unique characteristics of each CGS within the SSA. Site descriptive data was obtained during field investigations conducted in January 1990. U.S. Geological Survey 7.5 minute topographical maps were used as data sources for distances, physiographic features, and topography (USGS, 1969a-f; 1982 a-b; and 1988a-d).

3.1 Site Search Area

Presented below is information on the physical, biological, and socio-cultural settings of the SSA.

3.1.1 Physical Setting

The SSA in central Nevada is a circular, 250-square-mile area in Lander County, centered approximately 8 miles southwest of the town of Austin in the Great Basin section of the Intermountain Plateau physiographic province of the United States. The Great Basin consists of linear, north-south mountain ranges separated by valleys. The SSA is located in the Upper Reese River Valley, flanked on the east by the Toiyabe Mountains and on the west by the Shoshone Mountains, with the ill-defined channel of the Reese River flowing northward through the center of the valley. The Toiyabe Mountains are rugged and reach a height of 10,500 feet above mean sea level (MSL) in the SSA, while the Shoshone Mountains have more gentle slopes and are slightly lower at 7,500 feet MSL. Most of the SSA and all of the CGSs are located in the areas of gently sloping alluvial and stream deposits of the Reese River, and all of the CGSs are located 3 to 6 miles west of the river.

Central Nevada's physiography, a series of alternating basins and ranges, is the result of block faulting. Bedrock geology in the SSA consists of volcanic and sedimentary rocks of Tertiary and Quaternary age, the geologic periods covering the last 65 million years

(Manitakos, 1989). Sedimentary deposits in the basin floor are derived from eroded materials from neighboring ranges (Hunt, 1967).

The SSA is located about 50 miles east of the 118° meridian seismic zone, which is one of the most active seismic zones in the United States. Major earthquakes along this zone include the 1903 event at Wonder, Nevada; two 1954 events in the Dixie Valley, which had Modified Mercalli (MM) intensities of up to X; and a 1954 event at Frenchman Station of MM intensity X. The Frenchman Station event caused vertical ground displacements of up to 20 feet, 50 miles of normal faulting, and $3,000 of damage to store goods. Outside of the 118° meridian zone, an 1872 event of MM intensity VII was centered 40 miles north of the SSA. Between 1854 and 1960, there were 18 events which had MM intensities between III and V, and two events which had MM intensities between IV and VIII within a 40-mile radius of the SSA (Howard *et al.*, 1978; Slemmons *et al.*, 1964; Stover, 1986).

This SSA could be subject to a very strong earthquake in the future, most likely as a result of fault movement within the 118° meridian seismic zone. Strong ground shaking could occur, but primary ground rupture due to fault movement would be unlikely. Secondary ground rupture could occur due to liquefaction or slope destabilization. For that reason, areas of shallow groundwater or potentially unstable slopes (e.g., stream banks, terrace scarps) were avoided during facility siting, thereby substantially reducing seismic hazards to a GWEN facility (Manitakos, 1989).

The primary mineral resource of commercial value found in the SSA is silver. Silver was first discovered in 1862 in Pony Canyon, where the town of Austin is now located. News of the discovery resulted in a rush to the area, reaching a peak in 1868, when production of ore yielded about $1,240,000 in bullion. After the initial boom, however, production fell off considerably, and only about $500,000 of bullion has been produced in the area since 1903. Due to the high cost of extracting mineral resources, only a few mines are operating today, and these are located in the hills above Austin. Although silver has been the main mineral resource mined in the area, small quantities of gold, copper, lead, antimony, zinc, uranium, and turquoise have also been mined (Stager, 1977).

Paleontological resources are located in the SSA, but are found mainly in the bedrock of mountain ranges, not in the valley floors. All of the CGSs have at least 60 inches of soil, so bedrock would not be disturbed. The only paleontological resources that might be found in the soil would consist of loose fragments washed down from the surrounding mountain slopes. These fragments are not likely to be significant because paleontological resources are generally of scientific value only when their origin is known, and it would be extremely difficult to trace the path of any fragments found in the soil back to their source in the mountains (Lugaski, 1990).

The soils of the Great Basin are Gray Desert soils, which tend to be very limy just a few inches below the surface. Even the surface is slightly limy, due to the small amount of precipitation available for leaching. Organic layers are thin to nonexistent, while salt concentrations are usually high (Hunt, 1967). The soils on the CGSs are in the Wendane-Bubus, the Ricert-Oruvada-Broyles, and the Wholan-Rasille associations, which are silt loams and sandy loams found on the alluvial fans of the Reese River. Due to the high concentration of lime, these soils tend to be neutral to strongly alkaline, with pH levels ranging from 6.6 to 9.0. Erosion by wind and water is slight. Permeability is moderate and runoff is slow. The seasonally high water table is from 40 to 120 feet below the surface. Water table depth is deeper in the alluvial fans near the mountains and gets steadily shallower closer to the Reese River (SCS, 1991). There is no prime farmland designation in Lander County (Prattee, 1990; Rowe, 1990). The specific soils on each CGS are discussed in Sections 3.2 to 3.7 of this EA.

The SSA has very little surface water. The only perennial watercourse in the SSA is the Reese River, a shifting, ill-defined channel flowing northward that rarely has large amounts of water in it. In some areas it disappears and reappears from springs, while in other areas it follows more established courses. There are no lakes or other bodies of surface water in the SSA, and there are no streams within 300 feet of the CGSs. In addition, none of the CGSs is within the 100-year floodplain of the Reese River (FIA, 1988). According to well logs provided by the Nevada State Department of Conservation and Natural Resources, the groundwater temperature near the SSA is cool and suitable for irrigation. According to the well logs, the depth to groundwater in the SSA ranges from 41 feet to 105 feet below

ground level (DWR, 1990). The distances from each CGS to the nearest surface water are given in Sections 3.2 to 3.7 of this EA.

The climate of the SSA is arid due to its position in the rain shadow of the Sierra Nevada Mountains, over 150 miles west of the SSA. The average annual precipitation in Austin is about 12 inches per year, most of which falls as snow on peaks of nearby mountains during winter storms, or during summer thunderstorms. The principal climatic features are dry pure air, much sunshine, and large daily ranges in temperature. Average temperature in Austin ranges from 28.5°F in January to 70.2°F in July. The minimum temperature on record in Austin is -25°F and the maximum temperature is 105°F. The growing season in Austin is 117 days per year. Winds in Nevada are generally light, except for occasional high winds associated with storms (USDA, 1941).

Air quality in the SSA is good and does not exceed the ambient air quality standards, which have been set by the State of Nevada (codified at Nevada Administrative Code 445.843). Only developments of 20 acres or more are required by the State of Nevada to obtain an air quality permit. The nearest area of non-attainment is in the Lower Reese River Valley, 40 miles north of the SSA. According to the Nevada Department of Conservation and Natural Resources, the area of the SSA has achieved a level of air quality attainment (Shifley, 1990). Air quality standards are discussed in Section 3.3.3, pages 3.3-1 to 3.3-7 of the FEIS.

3.1.2 Biological Setting

The native vegetation of the Great Basin consists of sagebrush on the valley floors, chaparral or mountain shrub on the lower mountain slopes, pinyon-juniper on the mid to upper mountain slopes, and ponderosa pine forests on the highest elevations. The SSA is composed mostly of the sagebrush ecosystem, which is characterized by big sagebrush, usually 1 to 7 feet high; associated plants include shadscale, hopsage, ephedra, and milkvetch. The pinyon-juniper ecosystem is often adjacent to sagebrush sites, usually occupying rockier and rougher terrain than sagebrush. These woodlands are characterized by widely spaced bushy trees, usually less than 15 feet tall, that are almost as wide as they are tall. Ponderosa pine forests are confined to the higher elevations

where precipitation is great enough and temperatures are cool enough to allow a sufficient water supply (USDA, 1977).

Vegetation and fauna are sparsely distributed throughout the SSA because of its arid climate. The Reese River Valley, where the CGSs are located, is mainly open range land with some agricultural areas. Plants on the CGSs include sage, shadscale, greasewood, bottlebrush squirreltail, Indian ricegrass, crested wheatgrass, globe mallow, cheatgrass, pepperweed, tansy mustard, and Russian thistle (Hicks, 1990).

Common animals in the Great Basin include the pronghorn antelope, which uses the sagebrush area as range land throughout the year. Mule deer use the sagebrush mainly during the winter season. Other mammals found in the sagebrush ecosystem include the Great Basin coyote, black-tailed jackrabbit, pygmy cottontail, Ord's kangaroo rat, Great Basin kangaroo rat, and the Utah prairie dog. Mammals found in the pinyon-juniper ecosystem include the mule deer, mountain lion, coyote, bobcat, wood rat, white-footed mouse, cliff chipmunk, jackrabbit, cottontail rabbit, rock squirrel, porcupine, gray fox, and, in some areas, elk (USDA, 1977).

Bird populations in the sagebrush ecosystem are small during the breeding season, averaging about 50 per 100 acres (USDA, 1977). The main raptor species found in a sagebrush ecosystem are the northern harrier, red-tailed hawk, Swainson's hawk, golden eagle, bald eagle, Cooper's hawk, prairie falcon, burrowing owl, and long-eared owl. Important game birds are the sage grouse and chukar. Over 50 other species nest within the sagebrush ecosystem in the Great Basin. The most numerous bird populations in the pinyon-juniper ecosystem include the plain titmouse, scrub jay, red-tailed hawk, golden eagle, northern flicker, pinyon jay, lead-colored bushtit, and rock wren. The chipping sparrow, common night hawk, black-throated gray warbler, cliff swallow, lark sparrow, evening grosbeak, black-throated sparrow, and mourning dove are found in the pinyon-juniper ecosystem during the summer season; the dark-eyed junco, Rocky Mountain nuthatch, mountain bluebird, American robin, and Steller's jay are found during the winter season (USDA, 1977).

The Federal Manual for Identifying and Delineating Jurisdictional Wetlands (GPO 1989-236-985/00336) states that an area must meet three criteria to be designated as wetland: hydric soils; hydrophytic vegetation; and wetlands hydrology, which includes a shallow water table and standing water for at least 7 days of the growing season (FICWD, 1989). This manual was used as the basis for wetland determination. Based on field investigations (Irving, 1990) and soils data (SCS, 1990), none of the CGSs examined as part of this EA meets these three criteria, nor do areas within 300 feet of the CGSs.

In compliance with Section 7 of the Endangered Species Act of 1973 as amended (16 United States Code [USC] 1531, *et seq.*, at 1536), list of threatened and endangered species within the county was obtained during informal consultation with the U.S. Fish and Wildlife Service (USFWS) (Appendix C, Hallock, 1990, pages C-5 through C-7 of this EA; Harlow, 1992, 1993, pages C-12 through C-14, and C-15 to C-17 of this EA). According to the latest list, no threatened or endangered species occur near the SSA.

However, 14 species that are candidates for federal listing could occur near the SSA: the pygmy rabbit (*Brachylagus idahoensis*), the spotted bat (*Euderma maculatum*), the northern goshawk (*Accipiter gentilis*), the ferruginous hawk (*Buteo regalis*), the black tern (*Chlidonias niger*), the western least bittern (*Ixobrychus exilis hesperis*), the loggerhead shrike (*Lanius ludovicianus*), the mountain quail (*Oreortyx pictus*), the white-faced ibis (*Plegadis chihi*), the spotted frog (*Rana pretiosa*), and four plant species: Eastwood's milkweed (*Asclepias eastwoodiana*), Elko rock-cress (*Arabis falcifructa*), Goodrich's biscuitroot (*Cymopterus goodrichii*), and desert whitlowgrass (*Draba arida*).

The pygmy rabbit is essentially a species of the deserts of the Great Basin, although it requires relatively moist soils in which to make its burrows. It is chiefly nocturnal but may be seen throughout the day. At least 600 acres of habitat are needed to sustain a breeding population (Thomas, 1979), although its home range is generally within 30 yards of the burrow (Ransom, 1981; Burt and Grossenheider, 1976). It feeds primarily on sagebrush and breeds from May through August (Thomas, 1979). The sagebrush habitat exists on four of the CGSs (CGSs -2, -3, -12, and -16) but no CGS contains moist soils; no water is present on the sites and the depth to the seasonally high water table is more than 40 feet from the surface.

The spotted bat ranges throughout the Intermountain West in a variety of habitats, including ponderosa pine forests and caves. It is most frequently found in California, Arizona, New Mexico, southern Colorado, and southern Utah; its most common habitat is rough, desert-like terrain with suitable roosting cliffs and with a water source within a few miles. The preferred daytime roosts are horizontal rock crevices or vertical rock surfaces of high cliffs and canyons, generally at elevations of 6,000 to 8,000 feet. Moths are the preferred prey (Allen, 1979; Barbour and Davis, 1969; Zeveloff and Collett, 1988). None of the CGSs contains the habitat required for this species.

The SSA lies near the edge of the northern goshawk's breeding range and is well within its wintering range. The northern goshawk has highly variable breeding requirements but exhibits a preference for older, denser stands of conifers that are imbedded in areas of younger conifer growth. Typically it nests near a water source and forages by short, fast searching flights or by perch-and-watch techniques. Foraging activity is highest in woodlands or at the woodland fringes, suggesting this is a species adapted to use of forest edges rather than the open prairies and deserts found on the CGSs. Prey consists of moderate to large birds and mammals (Johnsgard, 1990). The CGSs do not contain the preferred breeding and foraging habitats of forests or forest edges. The CGSs are at least 4 miles from the nearest wooded hillsides.

The ferruginous hawk is a species of semi-arid lands, primarily semi-arid grasslands. The hawk specializes in hunting rodents and rabbits, only occasionally taking birds or reptiles. Nesting in Nevada, where it is a common breeding species, is primarily restricted to east-central Nevada in White Pine and Elko Counties, although isolated pairs occur throughout the state. Their preferred nesting sites are junipers at the interface on pinyon-juniper and desert shrub communities. Their hunting patterns vary but emphasize short or low flights. Their usual hunting pattern involves low flight over open ground in which the bird flaps its wings several times and then glides, although they occasionally hunt by hovering, and on rare occasions by soaring (Herron *et al.*, 1985). They also forage from perches or from flight altitudes up to 100 meters above the ground (Johnsgard, 1990). Breeding habitat is absent from the CGSs, each of which is on sagebrush-dominated alluvial fans at least a

mile from the juniper-dominated slopes of the bordering mountains. However, the hawk could forage on the CGSs.

The black tern is an insectivorous species that nests in marshes, sloughs, and wet meadows. It forages in open meadow, marshes, and freshly plowed fields, frequently following the plow (Ehrlich *et al.*, 1988). Both breeding and prime foraging habitat for this species are absent from the CGSs.

The western least bittern is a wetlands species that nests in emergent vegetation or low shrubs in marshes. It feeds on fish, insects, amphibians, small mammals, and possibly the eggs of other birds. It uses a stalk-and-strike foraging technique, often standing motionless in the water and spearing fish or other prey (Ehrlich *et al.*, 1988). Both breeding and foraging habitats are absent from the CGSs.

The loggerhead shrike is found throughout the United States in a variety of habitats, primarily open country with sparse vegetation of low shrubs and herbs. It prefers areas with nearby perching sites such as fences, woody vegetation, or hedgerows. It forages for insects, small mammals, and small birds using short, straight flights from these perches (Ehrlich *et al.*, 1988; Ransom, 1981). Shrikes nest near water, and breeding pairs occupy areas of 13 to 40 acres although solitary birds probably defend somewhat smaller territories (Jaeger, 1961). It forages in northern California and adjacent areas from March through October and overwinters in the southern United States and areas further south. It breeds in April, May, and June (Thomas, 1979). Although breeding habitat is absent from the CGSs, foraging habitat is present on all but two of the CGSs.

The mountain quail is a species of brushy habitats of the northwestern United States. It occurs in overgrown clearings in forests, burned areas, chaparral, and pinyon-juniper woodlands. Nests are usually placed at the bases of shrubs or beside fallen logs. It migrates seasonally between altitude zones and winters at the lower altitudes. It feeds primarily on plant parts and is unique among the North American quails in its tendency tc migrate on foot (Ehrlich *et al.*, 1988). The forest successional/chaparral/dense-shrub vegetation used by this species is absent from the CGSs.

The white-faced ibis is a wetlands species found mostly within fresh-water habitats. It migrates seasonally, breeding in the eastern United States and overwintering in South America. Nests are usually on the ground in wetlands and are aggregated in small clusters. The diet is based primarily on aquatic invertebrates, with secondary contributions from insects and small vertebrates. Both the breeding and foraging habitats for this species are absent from the CGSs (Ehrlich *et al.*, 1988).

The spotted frog occurs in a number of upland and wetland habitats throughout the northwestern states. Marshes and ponds are its primary breeding sites; permanent streams are a secondary breeding site. It may forage in areas adjacent to the wetlands. These wetland habitats are absent from all of the CGSs. In the northern part of its range, it hibernates during the winter, forages from February through October, and breeds from April through September (Thomas, 1979).

Eastwood's milkweed is a small perennial herb that is found on clay soils on low hills and in gulches in valley bottoms in central Nevada. It is occasionally found in shallow gullies on gravelly clay slopes. It occurs at elevations of 1,500 to 2,000 meters (about 4,500 to 6,000 feet) (Cronquist *et al.*, 1984). The clay soils and slopes required for this species are absent from the CGSs.

Elko rock-crest grows in rock crevices on slopes of high ridges in mountain ranges. Goodrich's biscuitroot and desert whitlowgrass are associated with alpine meadows (Withers, 1990).

The State of Nevada Natural Heritage Database lists plants and animals that are considered sensitive species (Kolar, 1990). Animals included on this list that have been observed in the vicinity of the SSA are the Koret's chekerspot (*Euphydryas editha koreti)*, the pallid skipper (*Polites sabuleti pallida)*, and the big jumping mouse *(Zapus princeps palatinus*). None of these species has been given federal or state status, nor have they been observed on or within 1 mile of any of the six CGSs (Kolar, 1990).

The Nevada Natural Heritage Program has listed the following sensitive plant species as being observed in the vicinity of the SSA:

Common Name	Latin Name
Eastwood's milkweed	*Asclepias eastwoodiana*
Goodrich's biscuitroot	*Cymopterus goodrichii*
Arid draba	*Draba arida*
Nevada greasebush	*Forsellesia nevadensis*
Northern gentian	*Gentianella amarella*
Raven's lomatium	*Lomatium ravenii*
Toiyabe bluebell	*Mertensia toiyabensis*
Toiyabe groundsel	*Senecio toiyabensis*
Lobed catchfly	*Silene scaposa var lobata*

Of these plant species, only the Eastwood's milkweed, Goodrich's biscuitroot, and arid draba are federally listed as candidate species. The rest of the plant species either have no state or federal status or were formerly considered candidate species. None of the plants has been observed on or within 1 mile of any of the six CGSs (Kolar, 1990).

3.1.3 Socio-Cultural Setting

Native American people occupied the Great Basin area prior to 7,000 years before the present (BP). However, little is known about this period due to a lack of archaeological resources from this time. More is known about the period from the Middle Holocene (approximately 5,000 BP) to the present. The Shoshone Indians occupied the area in historic times, and had as many as 41 camps or villages in the Reese River Valley. These camps and villages were located along the base of the mountain ranges, where the Shoshone had easy access to the resources on both the ranges and the valley floor (Hicks, 1990).

The first Euro-American to enter the Reese River Valley was John Reese, a scout for an expedition led by Colonel E. Steptoe in 1854. From 1860 to 1861, the valley was crossed by the Pony Express Trail, which runs through the center of the SSA. After the Pony

Express was terminated in 1861, the Butterfield Overland Mail and Stage Company began using the route. This road, known now as the Old Overland Road, was used until late 1862, when the road was moved north to New Pass.

With the discovery of silver ore in Pony Canyon in 1862, the Reese River Mining District was born. Farmers and ranchers began settling into the Reese River Valley, growing barley, potatoes, turnips, and other vegetables, and raising sheep and cattle. By the summer of 1863, Austin and the Reese River Mining District had a population of 2,000 people. In the fall of that year, Austin was made the seat of Lander County. After 1864, Austin became a trading and commercial center for mining camps as far away as Elko and Lincoln counties. At its peak, Austin boasted a population of 10,000. In 1880, the Nevada Central Railroad built a line into Austin, enhancing its position as a cultural and mining center. The mining boom lasted until the mid 1880s, when production of ore decreased and many mines closed. The last commercially important mine closed in 1898. Since that time, ranching and agriculture have taken the place of mining in importance (Hicks, 1990; Smith, 1989).

The Nevada State Historic Preservation Officer (SHPO) was consulted as required by the National Historic Preservation Act (16 USC 470, *et seq.*). The Nevada SHPO determined that all CGSs had equal potential for containing previously unrecorded archaeological or historic sites and recommended that an archaeological study be conducted (Appendix C, Baldrica, 1990, page C-9 of this EA).

In June 1990, a Class III cultural resources inventory was conducted on five of the CGSs (Hicks, 1990). The Renfro site (CGS-15) was withdrawn prior to the on-site survey. The survey consisted of an archival data search for historic properties within the SSA and an on-site archaeological survey of each CGS. The data search revealed that three important historic features are present in the SSA: the Austin Historic District, and portions of the Pony Express Trail and the Old Overland Road. The data search also revealed that six Class III inventories of cultural resources had previously been conducted in the SSA. None of these inventories uncovered any other cultural resources eligible for listing on the National Register of Historic Places (NRHP) (Hicks, 1990).

The on-site archaeological survey was conducted by a qualified archaeologist using pedestrian transects at 30-meter (approximately 99-foot) intervals. A variety of historic trash was noted on many of the CGSs, but all of the trash is under 50 years old. No significant cultural remains were found on four of the five sites surveyed; a single modified core reduction flake of gold and gray chert was found on the BLM 2 site (CGS-12). A radius of 10 meters (approximately 33 feet) around this flake was closely examined, but no additional artifacts were noted. No cultural resources were found during this survey that are eligible for inclusion on the NRHP (Hicks, 1990).

For reasons discussed in Section 4.8.1.3, beginning on page 4.8-2 of the FEIS and Section 4.1.3 of this EA, significant historic structures that occur within 1.5 miles of a CGS are potentially subject to adverse visual impacts from the relay node facility. The archival data search indicated that no historic properties listed or potentially eligible for listing on the NRHP are present on or within 1.5 miles of any of the sites. The Austin Historic District is the only site in the SSA that is listed on the NRHP, but it is 11 to 15 miles northwest of the CGSs, so a GWEN tower would not be visible from Austin. Furthermore, this historic district sits in Pony Canyon, which is oriented northwest to southeast and has high ridges on either side of the town that screen the view of the CGSs.

The Pony Express Trail, which goes from southwest to northeast in the SSA, has been determined eligible by the National Park Service for designation as a National Historic Trail (see Figure 2.1 of this EA). This designation relates to the entire trail, rather than to selected portions. This means that the trail is considered to have national historical significance, with a far-reaching effect on broad patterns of American culture, although the route need not be currently discernible. Today there is little physical trace of the Pony Express Trail; its actual routes varied from week to week. Its historic significance, more than its setting, makes this trail eligible for designation as a National Historic Trail (USDI, 1987). However, the U.S. Congress has not yet authorized this National Historic Trail designation (Baldrica, 1990).

The Old Overland Road follows the same general route as the Pony Express Trail through the SSA, covering approximately 17.5 miles from southwest to northeast through the

Reese River Valley. Other segments of the same two trails outside of the SSA follow completely different paths (McGonagle, 1990).

The Nevada SHPO considers the Old Overland Road potentially eligible for designation as a National Historic Trail, but neither the Pony Express Trail nor the Old Overland Road has been thoroughly studied or inventoried. For this reason, it is unknown if either route would be eligible for the NRHP or if the Old Overland Road would be eligible for designation as a National Historic Trail (Baldrica, 1990). However, both are considered potentially eligible for the NRHP, a designation that can be related to local historical significance rather than national. For both of these designations, setting is unlikely to be considered important to their eligibility, at least for the portions of the trails within the SSA. This is due to alterations to setting that the trails have already undergone (Hicks, 1990; McGonagle, 1990).

It is known that the landscape of the SSA surrounding these routes has undergone considerable alteration, with man-made additions of U.S. Highway 50, State Highway 2, various county and ranch roads, wells, houses, outbuildings, farming equipment, power lines, and large cultivated areas. Most of the historic path of these two routes has been incorporated into a present-day dirt road system. According to the National Park Service, no portions of the Pony Express Trail in Nevada are in their original pristine condition (USDI, 1987).

In compliance with the American Indian Religious Freedom Act of 1978 (42 USC 1996), the Bureau of Indian Affairs (BIA), the Nevada SHPO, and the Nevada State Indian Commission were consulted in order to locate tribes associated with the project area (Allan, 1992; Baldrica, 1992; Palmer, 1990; Sutherland, 1992a, 1992b). Based on the recommendations of these organizations, eight tribal organizations were notified of the GWEN project and information was requested regarding traditional, religious, or sacred sites within the SSA: the Duck Valley Reservation of Shoshone-Paiute, the Yomba Reservation of Western Shoshone, the Inter-Tribal Council of Nevada, the TE-Moak Tribes of Western Shoshone in Elko, and four bands or the TE-Moak (South Fork, Wells, Battle Mountain, and Elko). Personal communication with the tribal administrator of the TE-Moak Tribes of Western Shoshone established that the tribe had no concerns about impacts of

the GWEN project on Native American sites (Gonzales, 1991, 1993). No response has been received to letters or to several attempts at telephone communication from the other tribes.

Land use in the area is predominantly open range for cattle and sheep grazing. Cattle and sheep ranching is practiced throughout the Reese River Valley. The Desert Land Entry Act opened the Upper Reese River Valley to irrigation in the 1960s, and by 1982, 12.5 percent of the land area in Lander County was used for agricultural farming (Census Bureau, 1982). The primary crops grown are alfalfa, wheat and barley. Areas of agriculture in the SSA are concentrated near the six CGSs (GACC, undated).

All of the sites have a county zoning designation of farm, forestry, and open reserve (A-3). There are no local tower restrictions (Lyngar, 1990).

The main east-west road through the area is U.S. Highway 50, a two-lane paved road. State Highway 2, a two-lane paved road, also runs east-west. State Route 305, a two-lane paved road, heads north from Austin toward Battle Mountain. County Road 214 runs north-south, and intersects State Highway 2 near the southwest corner of the SSA. County Road 215 also runs north-south, intersecting State Highway 2 near the center of the SSA. Austin Airport, a county airport, is just north of State Highway 2, near the center of the SSA.

Sources of ambient noise are limited primarily to the operation of farm equipment and traffic. As described in Section 3.5.3, beginning on page 3.5-1 of the FEIS, local ordinances typically set maximum noise level limits at 70 to 75 dBA for land under agricultural use. Lander County has no local noise ordinance (Lyngar, 1990).

The estimated 1989 population in Lander County was 4,331. The 1990 census is expected to reflect little growth. The county has little industry other than agriculture, mining, and related services. Per capita income for Lander County in 1989 was estimated at $9,986, which was below the state figure of $12,867 (NPDC, 1989). Unemployment in March 1989 was 6.6 percent, higher than the state figure of 5.75 percent for that year (BLS, 1989).

Austin is the only developed town in the SSA, with a 1989 population of 235 (NPDC, 1989). Austin is located in Pony Canyon, which is on the northeastern edge of the SSA. Outside of the Austin area the density of residential structures is very low.

Hiking, camping, fishing, hunting, and rock collecting are the primary recreational activities in the area. The Toiyabe National Forest and the town of Austin are the main centers of recreation and sightseeing. However, various sites are scattered throughout Lander County that offer recreational and sightseeing activities. Most of these areas are very remote and have sparse visitation (GACC, undated). The nearest recreation area is the Big Creek campground, over 8 miles from any of the CGSs (Munoz, 1990).

The visual setting of the SSA is rural in character, with fairly level topography in the Reese River Valley and steep mountain topography in the Toiyabe and Shoshone ranges. Visible patterns of development tend to be linear and are evident in the local road system and overhead utility lines. The complexity of the skyline is generally low, as defined in Section 4.8.1.3, page 4.8-10 of the FEIS, although farmsteads and utility lines provide variation on a local level and the Toiyabe and Shoshone mountains dominate the horizon. Tall structures, other than silos and power poles, are generally limited to the town of Austin.

3.2 Alternative 1: BLM 1 Site (CGS-2)

The BLM 1 site is on flat land, with soils of the Ricert-Oruvada-Broyles association. These soils are gravelly fine sandy loams, neutral to strongly alkaline, with pH values ranging from 6.6 to 9.0 (SCS, 1990, 1991). This site is in its natural state and has not been cultivated; vegetation consists solely of native sagebrush, grasses, and broad-leaved herbs. The site is currently open rangeland. The site is dry, with no standing water, and lies between two intermittent drainage courses 1,700 feet to the north and 1,000 feet to the south.

The town of Austin, an historic district listed on the NRHP and the nearest residential community, is approximately 14.6 miles to the northeast. The Pony Express Trail/Old Overland Road is approximately 1 mile northwest of the site.

3.3 Alternative 2: Young Site (CGS-3)

The Young site is on flat land, with soils of the Wendane-Bubus association and the Ricert-Oruvada-Broyles association. Soils of the Wendane-Bubus association are silt loams and very fine sandy loams, strongly alkaline, with pH values ranging from 8.5 to 9.0. Soils of the Ricert-Oruvada-Broyles association are gravelly fine sandy loams, neutral to strongly alkaline, with pH values ranging from 6.6 to 9.0 (SCS, 1990, 1991). The site is an agricultural field. Although vegetation on the site consists solely of sagebrush, grasses, and broad-leaved herbs, the site has furrowed soil indicating that it has been cultivated and irrigated. The site is dry, with no standing water, and lies between two intermittent drainage courses, one of which is 2,500 feet to the north; the other is 300 feet to the south.

The town of Austin, an historic district listed on the NRHP and the nearest residential community, is over 14 miles to the northeast. The Pony Express Trail/Old Overland Road is 1.5 miles northwest of the site.

3.4 Alternative 3: Holland Site (CGS-6)

The Holland site is on flat land, with soils of the Wholan-Rasille Non-alkaline association. These soils are silt loams and very fine sandy loams, mildly to moderately alkaline, with pH values ranging from 7.4 to 8.4 (SCS, 1990, 1991). The site is an agricultural field. Although vegetation on the site consists solely of weeds and contains no natural plant communities, the site has furrowed soil, indicating that it has been cultivated and irrigated. The site is dry, with no standing water; the nearest intermittent drainage course is 2,100 feet to the northwest.

The town of Austin, an historic district listed on the NRHP and the nearest residential community, is over 15 miles to the northeast. The Pony Express Trail/Old Overland Road is 2.5 miles northwest of the site.

3.5 Alternative 4: BLM 2 Site (CGS-12)

The BLM 2 site is on flat land, with soils of the Wholan-Rasille Alkaline association. These soils are silt loams and very fine sandy loams, mildly to strongly alkaline, with pH values ranging from 7.4 to 9.0 (SCS, 1990, 1991). This site is in its natural state and has not been cultivated; vegetation on the site consists solely of native sagebrush, grasses, and broad-leaved herbs. The site is currently rangeland. The site is dry, with no standing water, and the ground plane would lie 400 feet southwest of an intermittent drainage course.

The town of Austin, an historic district listed on the NRHP and the nearest residential community, is over 11 miles to the northeast. The Pony Express Trail/Old Overland Road is 1 mile northwest of the site.

3.6 Alternative 5: Renfro Site (CGS-15)

The Renfro site is on flat land, with soils of the Wholan-Rasille Non-alkaline association. These soils are silt loams and very fine sandy loams, mildly to moderately alkaline, with pH values ranging from 7.4 to 8.4 (SCS, 1990, 1991). The site is an agricultural field. Although there is no vegetation on the site, the site has furrowed soil, indicating that it has been cultivated and irrigated. The site is dry, with no standing water, and lies 800 feet west of the head of an intermittent drainage course.

The town of Austin, an historic district listed on the NRHP and the nearest residential community, is over 15 miles to the northeast. The Pony Express Trail/Old Overland Road is 3 miles northwest of the site.

3.7 Alternative 6: Rose Site (CGS-16)

The Rose site is on flat land, with soils of the Wholan-Rasille Non-alkaline association. These soils are silt loams and very fine sandy loams, mildly to moderately alkaline, with pH values ranging from 7.4 to 8.4 (SCS, 1990, 1991). Vegetation consists solely of native sagebrush, grasses, and broad-leaved herbs. The site is used as pasture land and horses

graze on the site. The site is dry, with no standing water, and lies 600 feet south of an intermittent drainage course.

The town of Austin, an historic district listed on the NRHP and the nearest residential community, is over 14 miles to the northeast. The Pony Express Trail/Old Overland Road is 2 miles northwest of the site.

4.0 ENVIRONMENTAL CONSEQUENCES OF ACTION ALTERNATIVES

This section discusses the potential impacts of the GWEN project on the environmental setting of the six CGSs in central Nevada. Several impacts which would be common to some or all of the action alternatives are discussed in Section 4.1 of this EA. Impacts are unknown at the Renfro site (CGS-15) because the site was withdrawn before an archaeological survey could be undertaken. There would be no significant impacts to the other five sites, as indicated in Sections 4.2, 4.3, 4.4, 4.5, and 4.7 of this EA

4.1 Common Features

Presented below is information on the physical, biological, and socio-cultural impacts common to some or all of the action alternatives.

4.1.1 Physical

Impacts from **construction** activities would not be significant. Construction would require localized earth-moving, including excavation and backfilling for placement of foundations and guy-wire anchors. Less than 3,800 square feet would be covered with concrete and gravel for the tower base and the equipment area enclosures. Similar coverage would be required for on-site access roads and parking; incidental activities during construction would disturb a similar amount. In total, about 0.25 acre would be occupied by foundations and the on-site access roads. Construction of the off-site access road and installation of utility lines would have no significant impacts because they would cover no more than 1,560 square feet of land along the previously graded public highway right-of-way, agricultural fields or open rangeland.

The ground plane would be installed using machines that bury wire approximately 1 foot below the surface with minimal disturbance of the soil surface. This process would require moving a small tractor or similar equipment over much of the 11-acre site, but it would not significantly disturb the existing vegetation or create a significant erosion hazard.

Impacts to **mineral resources** would be minor, as indicated in Section 4.1.1.4, page 4.1-2 of the FEIS. In most cases, mineral resources were avoided in the siting process. The silver, gold, copper, lead, antimony, zinc, uranium, and turquoise that are mined in this area of Nevada are found in the mountain ranges, not in the valley floors, so it is highly unlikely that any of the CGSs would contain significant mineral resources. The CGSs in central Nevada are located 10 miles from the existing commercial silver mines, the primary mineral resource of commercial value in the SSA (Stager, 1977). If any mineral resources are present under any site, development of that site would only deny access to a small portion of those resources for the lifetime of the project and would not result in any significant impact.

Impacts on **paleontological resources** are not anticipated because no significant paleontological resources are known to occur on any CGS (Lugaski, 1990). However, if any fossils are found during construction, work that might affect them will be suspended while the Nevada State Bureau of Mines and Geology is notified and the significance of the find is evaluated.

Erosion and increase in storm water runoff would not be significant. All sites have slopes of less than 1 percent, so any required grading to level the site would be minimal. In addition, standard measures for erosion control would be used during and after site construction. Sites currently in agricultural use will be replanted after construction is finished; sites with desert vegetation will be restored to preexisting natural vegetation.

None of the CGSs is located in a **100-year floodplain** (FIA, 1988).

No **prime farmland** would be removed from production for the project, because none of the sites contains designated prime farmland (Prattee, 1990; Rowe, 1990).

No significant impacts on **drinking water** are expected, as stated in Sections 3.2.4.1 and 4.2.1.1, pages 3.2-2 and 4.2-3 of the FEIS. Corrosion of the ground plane is not anticipated to raise copper concentrations in any aquifer or surface water body by more than 20 micrograms per liter (µg/l). This represents 2 percent of the maximum allowable copper concentrations permitted by the State of Nevada for raw water sources for potable

water supply (Nevada Administrative Code 445.248). The Nevada standard is the same as the Environmental Protection Agency (EPA) standard, which is intended to maintain the aesthetic properties that relate to public acceptance of drinking water and is not related to public health. A threshold for the effects of copper on human health has not been determined (EPA, 1985).

Impacts on **surface water and wetlands** that support aquatic plants and animals would not be significant. Potential impacts could occur when the ground plane is less than 300 feet from surface water or wetlands, if the soil is acidic, or the depth to the seasonally high water table is less than 3 feet from the ground plane, as discussed in Section 4.2.1.1, page 4.2-3 of the FEIS. No impacts are expected because soils on all CGSs are neutral to strongly alkaline, the depth to the seasonally high water table is 40 to 120 feet below the surface, and all CGSs are located at least 300 feet from surface water. Under those conditions, impacts from copper leachate would be negligible.

Impacts on **air quality** would not be significant. Temporary but insignificant increases in air pollutant emissions would occur during construction, primarily from greater use of heavy machinery than would be required in normal farming operations. During operation of the BUPG at 100 percent load, total yearly emissions of the BUPG would be less than 350 pounds per pollutant, as described in Section 2.1.2 of this EA. These are well below the standards set by the Clean Air Act (42 USC 7401, *et seq.*), which requires permits for facilities emitting any single regulated substance at the rate of 50 tons per year. Hence, the project would not result in violation of National Primary and Secondary Ambient Air Quality Standards. As stated in Section 3.1.1 of this EA, air quality permits are not required in the State of Nevada for projects under 20 acres (Shifley, 1990).

4.1.2 Biological

Impacts on **wetlands and other wildlife habitats** would not be significant. Each CGS is either an agricultural field or is open range land. Each site is far from areas of woodland, ponds, lakes, or perennial streams. None of the sites contains or is within 300 feet of wetlands. Consequently, no critical or exceptionally valuable wildlife habitats would be at risk.

Bird collisions with the tower may occur but are not expected to be significant. Section 4.4.1.5, page 4.4-5 of the FEIS states that the majority of bird collisions occur in adverse weather conditions when the visibility of man-made structures is obscured and birds may be forced to lower their flight level. Generally, songbirds (passerines) are more likely to collide with a tower or the guy wires than are raptors or waterfowl (Avery *et al.*, 1980). To minimize the probability of collisions, areas with high concentrations of bird flight activity, such as feeding and nesting habitats, prominent topographical features that could serve as navigational aids, known migration corridors, and raptor roosting areas, were avoided in the siting process.

No federally listed or candidate **threatened or endangered species** would be affected since no such species are found on or adjacent to the CGSs in central Nevada. This determination was made after informal consultation with the USFWS in compliance with Section 7 of the Endangered Species Act of 1973 as amended (16 USC 1531, *et seq.*, at 1536) (Appendix C, Harlow, 1990, 1992, 1993, pages C-8, C-12 to C-14, and C-15 to C-17 of this EA). In addition, no significant impacts are expected on the 14 candidates for federal listing.

Moist soils are required for the pygmy rabbit and the CGSs are located on uplands with a deep water table (greater than 40 feet) and are at least 300 feet from the nearest intermittent stream. Thus, the distances to the closest potential burrowing sites are at least twice the typical radius of a pygmy rabbit's home range and impacts are not expected.

The spotted bat habitats of high cliffs and canyons, ponderosa pine forests, and caves are absent from the CGSs, which are located on the gently sloping alluvium near the center of the valley. In addition, if any bats were to forage within the vicinity of the tower, their sensitive echolocation system would protect them from collision with the tower.

The forest habitats preferred for breeding and foraging by the northern goshawk are remote from the CGSs, each of which is at least 4 miles from the nearest forested slopes. The northern goshawk is therefore unlikely to occur at any of the CGSs even as a transient.

No significant impacts are expected on the ferruginous hawk. The forest breeding habitat for the hawks is absent from the CGSs, each of which is on sagebrush-dominated alluvial fans at least 4 miles from the juniper-dominated slopes of the bordering mountains. It is possible that non-breeding individuals may forage in the area on a seasonal basis, and they could collide with a GWEN tower or its associated wires. But given the brevity of the typical foraging flight and the use of perches, the probability is low that a foraging ferruginous hawk would be involved in prolonged pursuit of prey that might prevent detection of the tower and its wires in time to take evasive action. Thus, the tower is not expected to significantly impact either nesting or foraging activities.

No significant impacts are expected on the black tern, western least bittern, or white-faced ibis, all of which require wetlands habitats for breeding and foraging. The CGSs are at least 300 feet from the closest intermittent stream and the depth to the seasonally high water table on the sites is greater than 40 feet. Similarly, no impacts are expected on the spotted frog, which requires marshes, ponds, and permanent streams for breeding.

No significant impacts are expected on the loggerhead shrike. Shrikes nest near water and the CGSs contain no perennial or intermittent streams. The banks of the Reese River, which might provide potential nesting sites, are 3 to 6 miles from the CGSs. The shrike could forage near some of the CGSs, four of which are covered with sagebrush and used as rangeland. However, given the foraging behavior of the shrike, which consists of short, straight flights from nearby perches, the probability of a shrike colliding with a guy wire is low, so the tower would not pose a significant hazard to the foraging shrike.

No significant impacts are expected on the mountain quail because the successional/chaparral/dense-shrub vegetation used by this species is absent from the CGSs.

No significant impacts are expected on Eastwood's milkweed because the clay soils, slopes, and gullies characterizing its habitat are absent from the CGSs. The soils on the sites are silt loams and fine sandy loams, rather than the clay and gravelly clay soils required for this species.

No significant impacts are expected on Elko rock-crest, Goodrich's biscuitroot, and desert whitlowgrass because their habitats are absent from the CGSs. Elko rock-crest requires rocky, mountain habitat, and Goodrich's biscuitroot and desert whitlowgrass require alpine meadows.

The Nevada Natural Heritage Program has identified the exact locations of plant and animal species it considers threatened and endangered; all such locations and their surrounding areas were avoided in the siting process, and none of the CGSs contains the habitats of these species (Kolar, 1990).

4.1.3 Socio-Cultural

Local employment would be increased slightly, primarily through use of local subcontractors for earth-moving and possibly for some of the facility's maintenance.

Impacts on **community support systems** would not be significant because the relay node will be unmanned and will use modest amounts of power comparable to that used by an average single-family house. Security needs will be met through agreements with local police officials to monitor the integrity of the site during routine patrols as detailed in Section 4.6.1.1, page 4.6.-1 of the FEIS.

Impacts on **land use** would not be significant. All candidate sites are zoned farm, forestry, and open reserve (A-3) (Lyngar, 1990). Care was taken in the site selection process to maintain setbacks from institutional uses such as schools, churches, recreational areas, and areas zoned residential. The tower would not significantly affect property values because non-noxious, nonresidential land uses, such as the proposed relay node, have no systematic effect on housing values, as stated in Section 4.7.1.3, page 4.7-8 of the FEIS.

Construction **noise** impacts would be temporary and insignificant. Operational noise from the backup generator would be less than 72 dBA at the site boundary. At 50 feet beyond the site boundary the noise level would drop below 65 dBA, as discussed in Section 2.1.2

of this EA. Although Lander County has no noise ordinances, this noise level is within the standards typically set for residential and mixed residential/agricultural use (55 to 65 dBA), as stated in Section 3.5.3, page 3.5-2 of the FEIS. In addition, the BUPG would only operate at this noise level for 2 hours per week during testing and during commercial power outages.

Impacts on **public health and safety** would not be significant, as discussed in Sections 4.11 and 4.12, beginning on pages 4.11-1 and 4.12-1, respectively, of the FEIS. Shock and burn risks would be associated with the buildup of electrical charges on ungrounded metallic objects inside the inner exclusionary (8-foot) fence located approximately 20 feet from the tower base. However, a grounded person within the outer exclusionary (4-foot) fence located approximately 330 feet from the tower base who touches an ungrounded object while the tower was transmitting would experience only a mild shock, sufficient to cause the individual to break contact but not cause harm. Furthermore, because the transmission periods would total between 6 and 8 seconds per hour during normal operations, the risk of even these mild shocks would be insignificant. Only a determined effort to enter the inner exclusionary zones, within the 8-foot fence, would put a person at increased risk of higher shock and a higher specific absorption rate, dependent on the period of prolonged grasping contact with an ungrounded metallic object. Fire hazards at the relay node facility would be low, as discussed in Section 4.12.1.1, page 4.12-1 of the FEIS. Radio-frequency emissions would not cause adverse health effects, as discussed in Section 4.4.1.6, pages 4.4-6 and 4.4-7 of the FEIS. Subsequent to the publication of the FEIS, further study confirmed the conclusion of the FEIS that there is no evidence of adverse effects of GWEN radio-frequency emissions on public health (NRC, 1992).

The relay node would operate in the LF band and therefore would not interfere with pacemakers, emergency communications, commercial and amateur radios, televisions, or garage door openers, as noted in Section 2.1.1.1, page 2-3 of the FEIS.

Impacts on **archaeological resources** are unknown on the Renfro site (CGS-15) because the site was withdrawn before the cultural resources survey was conducted. Impacts on archaeological resources at the other five sites would not be significant, as the on-site survey of these CGSs revealed no cultural resources eligible for listing on the

NRHP (Hicks, 1990). The Nevada SHPO concurs with this determination (Appendix C, Baldrica, 1990, page C-11 of this EA). If any archaeological resources are found on the sites during construction, work that might affect them will be suspended while the Nevada SHPO and the Office of the State Archaeologist are notified in accordance with the provisions of 16 USC 470, *et seq.*, at 470f.

Impacts on **historic properties** would not be significant. Based on the cultural resources survey, there are no properties listed, eligible, or potentially eligible for listing on the NRHP within 1.5 miles of a CGS where setting would be important to their eligibility. Impacts to the town of Austin, listed on the NRHP, would not be significant because Austin is between 11 and 15 miles from each of the CGSs, and because the walls of the canyon in which Austin sits block views in the direction of the CGSs. Visual impacts to the Pony Express Trail and the Old Overland Road, two historic travel routes that follow the same general path through the SSA, would not be significant. Although no determination has yet been made regarding the eligibility of either route for the NRHP and only the Pony Express Trail has been determined eligible for designation as a National Historic Trail (USDI, 1987), setting is not considered to be a criterion of eligibility for the portions of either route within the SSA (Hicks, 1990; McGonagle, 1990). This is due to the already disturbed setting in the SSA and to the fact that the path these two routes follow has already been incorporated into the existing modern dirt road system. The Nevada SHPO concurs with the results of the survey and has stated that if any of the five sites examined were selected, further efforts to identify historic properties would not be required (Appendix C, Baldrica, 1990, pages C-10 and C-11 of this EA).

Significant impacts to **Native American traditional, religious, or sacred sites** are not anticipated. Based on recommendations of the BIA, the Nevada SHPO, and the Nevada State Indian Commission, eight tribal organizations were notified of the GWEN project and information was requested regarding traditional, religious, or sacred sites within the SSA: the Duck Valley Reservation of Shoshone-Paiute, the Yomba Reservation of Western Shoshone, the Inter-Tribal Council of Nevada, the TE-Moak Tribes of Western Shoshone in Elko, and four bands of the TE-Moak (South Fork, Wells, Battle Mountain, and Elko). Personal communication with the tribal administrator of the TE-Moak Tribes of Western Shoshone established that the tribe had no concerns about impacts of the GWEN

project on Native American sites (Gonzales, 1991, 1993). No response has been received to letters or to several attempts at telephone communication from the other tribes.

Visual impacts associated with a GWEN tower are discussed in Sections 3.8 and 4.8, pages 3.8-1 and 4.8-1, respectively, of the FEIS. The significance of a visual impact would depend on the visual dominance of the GWEN facility and the sensitivity of the affected views. Visual dominance is the degree to which a GWEN facility would compete with other features of the existing landscape for the attention of the viewer. Section 3.8.4, beginning on page 3.8-3 of the FEIS defines four levels of dominance, called Visual Modification Classes (VMC):

- VMC 1, not noticeable: the tower would be overlooked by all but the most interested viewers

- VMC 2, noticeable, visually subordinate: the tower would be noticeable to most viewers without being pointed out but would not compete with other features for their attention

- VMC 3, distracting, visually codominant: the tower would compete with other features in the landscape for the viewer's attention

- VMC 4, visually dominant, demands attention: the tower would be the focus of attention and tend to dominate the view.

Visual sensitivity is a measure of the public's reaction to a proposed change of the affected view and is a function of the viewer's activity, awareness, goals, and values. Consequently, the more sensitive the view, the stronger will be the public reaction to any alteration of it. Areas defined in the FEIS as having high visual sensitivity include national and state parks; designated national, state, or local historic sites where setting is important to the historic significance; and travel routes providing primary access to these sites. Examples of areas having medium visual sensitivity would be locally popular, but undesignated, beaches or public use areas, and the travel routes that provide primary

access to them. Low visual sensitivity includes those views from sites, areas, travel routes, and sections of travel routes not identified as medium and high in sensitivity.

Significant visual impacts would occur if the relay node facility were to dominate or codominate (VMC 4 or 3) a high-sensitivity view or dominate (VMC 4) a medium-sensitivity view. If the relay node facility cannot be seen from medium-to-high sensitivity routes or areas, then visual impacts are not considered significant. Distance is the primary factor in determining visual dominance and therefore visual impacts. At distances greater than 3 miles, a GWEN tower would not be visible to the unaided eye. At 1.5 to 3 miles, the tower would be visually subordinate if noticeable (VMC 2) but more usually would not be noticed (VMC 1) because of its grey color and lack of mass. If a viewer at this distance actively sought the tower, it would appear as a thin vertical line on the horizon. Within 1.5 miles, the tower becomes a more important component of the view. In addition, other aspects of the tower's setting, such as focal point sensitivity, skyline complexity, competing feature interest, and topographic and vegetative screening, become important considerations in determining the level of visual impact.

Based on USGS topographic maps and a windshield survey, there are no high or medium sensitivity views within 1.5 miles of any CGS, so **visual** impacts would not be significant.

4.2 Alternative 1: BLM 1 Site (CGS-2)

No significant impacts are expected.

4.3 Alternative 2: Young Site (CGS-3)

No significant impacts are expected.

4.4 Alternative 3: Holland Site (CGS-6)

No significant impacts are expected.

4.5 Alternative 4: BLM 2 Site (CGS-12)

No significant impacts are expected.

4.6 Alternative 5: Renfro Site (CGS-15)

Complete impacts are unknown. The landowner withdrew the site before the archaeological survey was undertaken, so the impacts to archaeological resources are unknown.

4.7 Alternative 6: Rose Site (CGS-16)

No significant impacts are expected.

4.8 No Action Alternative

No environmental impact would result from adoption of the no action alternative.

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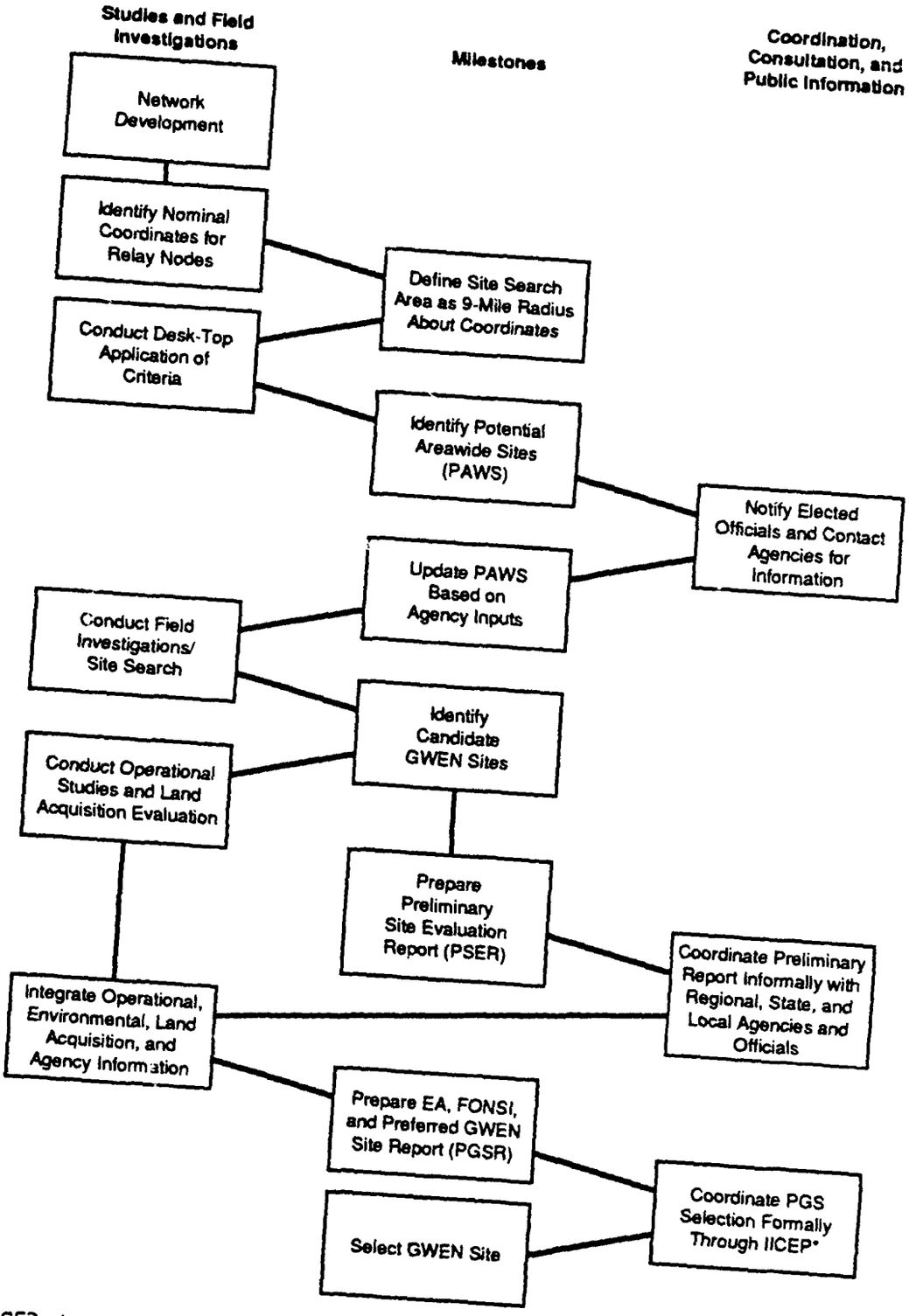
APPENDIX A

SITE SELECTION PROCESS

SITE SELECTION PROCESS

Figure A.1 of this EA shows the sequence of events during the selection of individual GWEN sites. Figure A.2 of this EA describes the screening process used during the field investigation to choose the six candidate GWEN sites (CGSs). The environmental siting criteria applied in the site selection process are defined in Tables 5-1 and 5-2, pages 5-7 through 5-14 of the FEIS.



*IICEP = Interagency/Intergovernmental Coordination for Environmental Planning.

FIGURE A.1 GROUND WAVE EMERGENCY NETWORK SITE SELECTION PROCESS

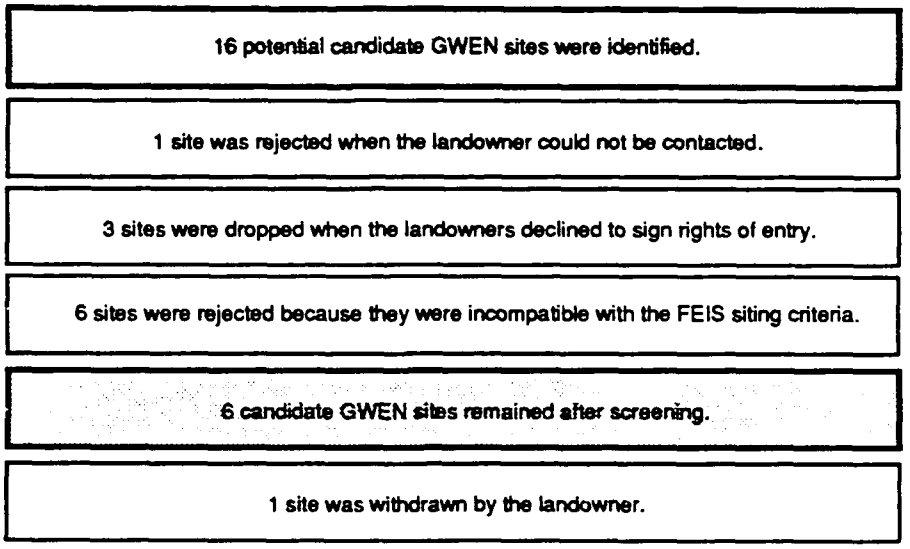


FIGURE A.2 RESULTS OF USING FEIS SITING CRITERIA TO SCREEN POTENTIAL CANDIDATE GWEN SITES IN THE CENTRAL NEVADA SITE SEARCH AREA

APPENDIX B

TOPOGRAPHIC SETTINGS OF CANDIDATE GWEN SITES

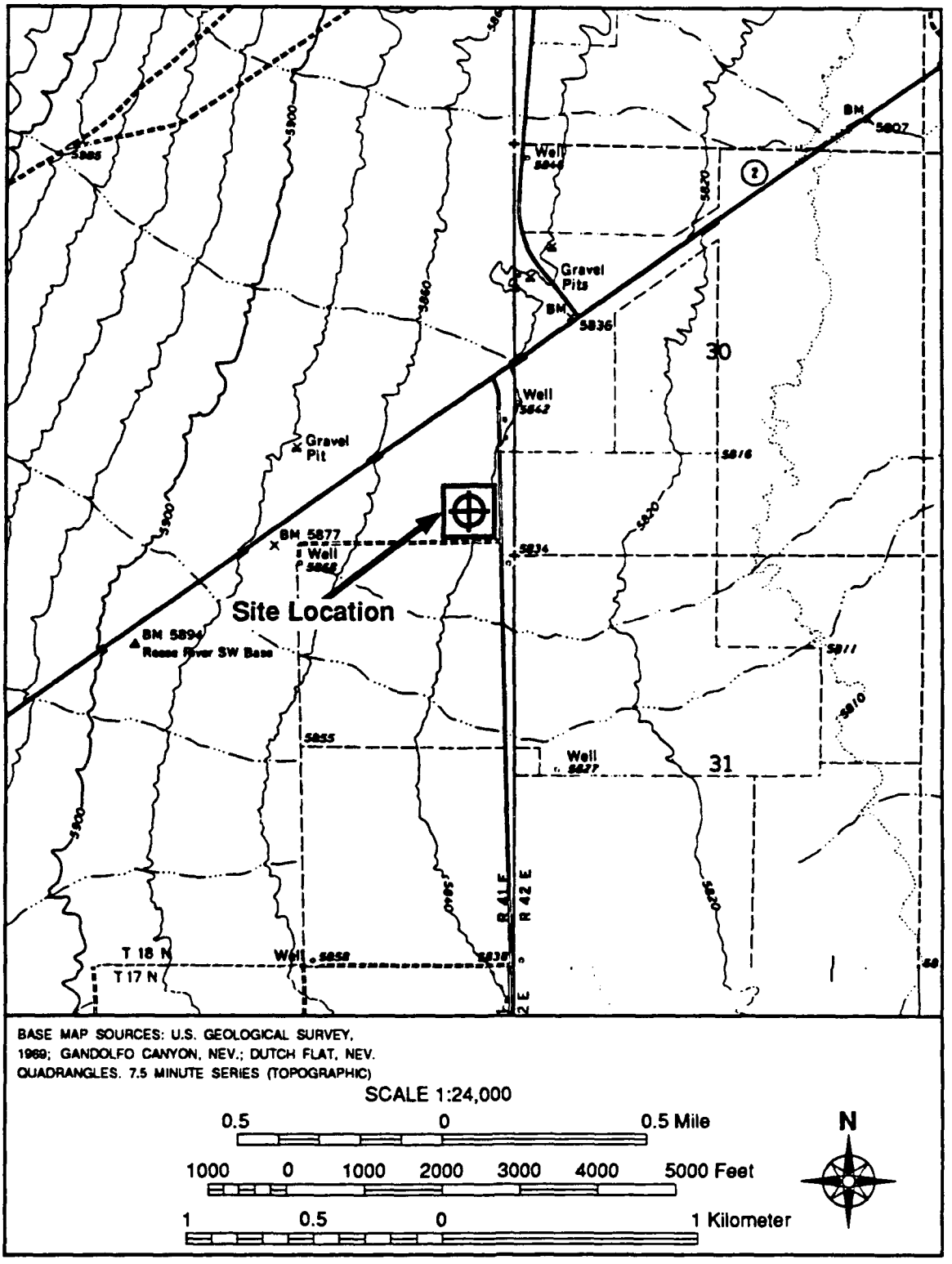


FIGURE B.1 TOPOGRAPHIC SETTING OF THE BLM 1 SITE (CGS-2)

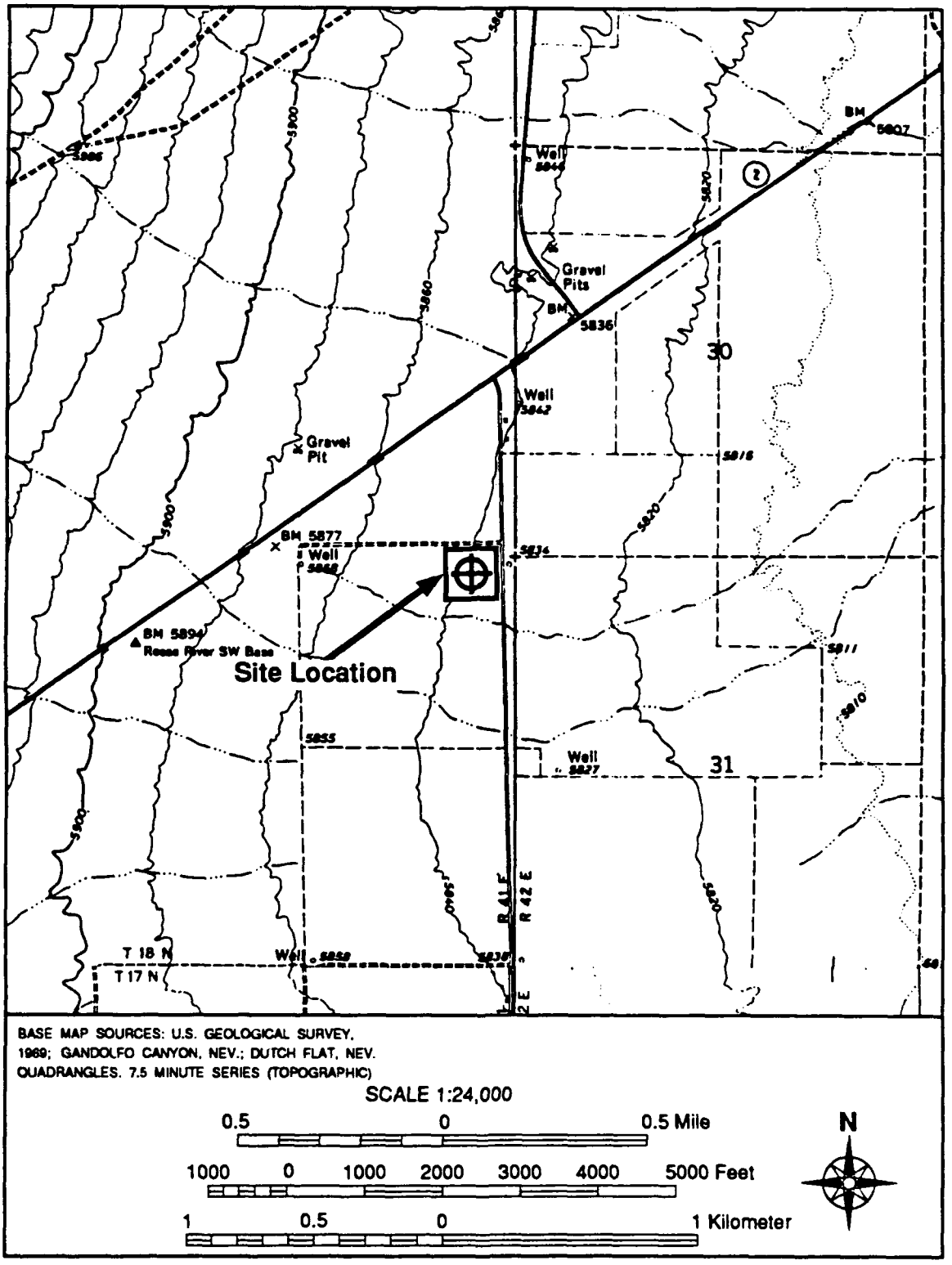


FIGURE B.2 TOPOGRAPHIC SETTING OF THE YOUNG SITE (CGS-3)

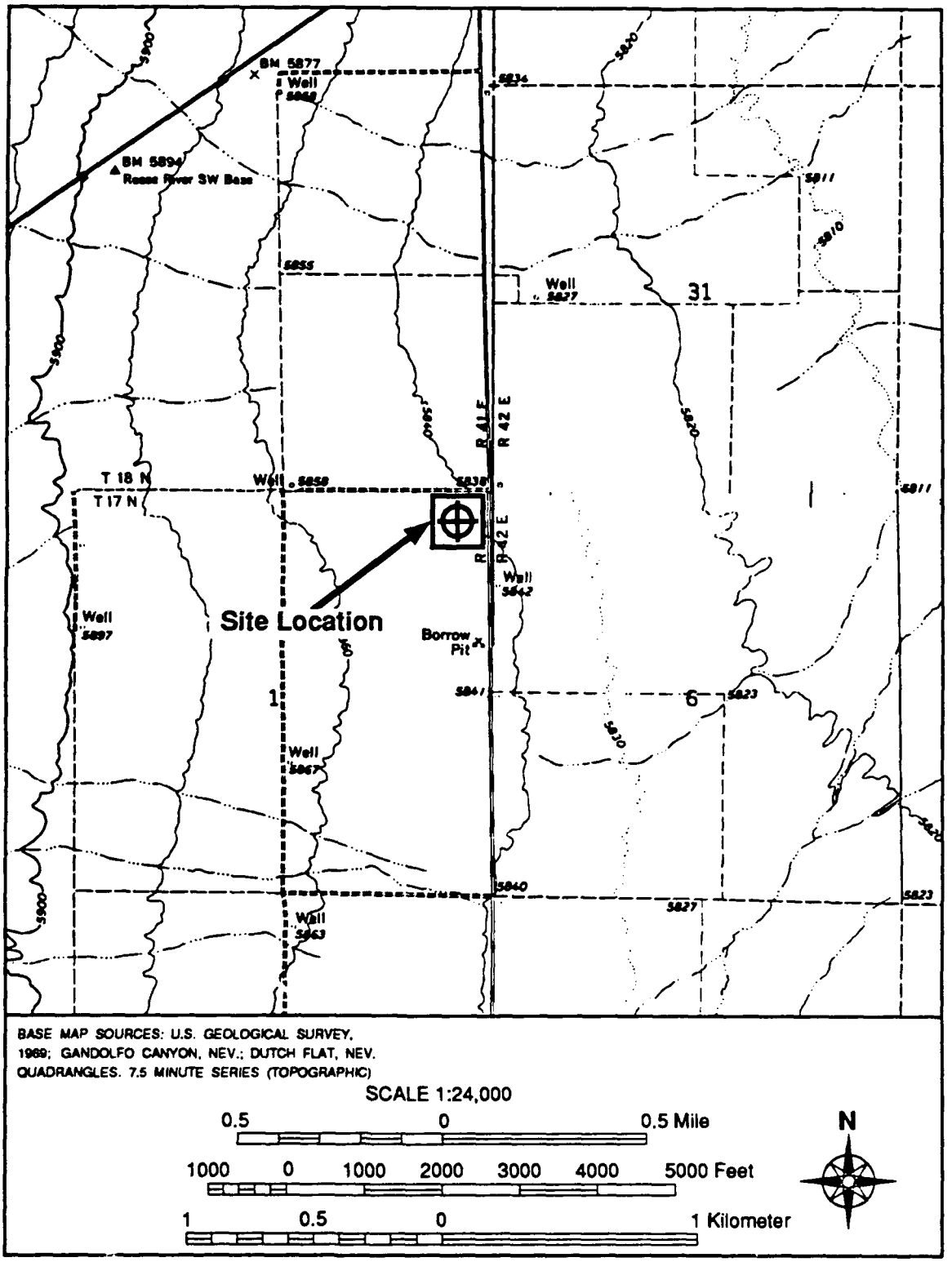


FIGURE B.3 TOPOGRAPHIC SETTING OF THE HOLLAND SITE (CGS-6)

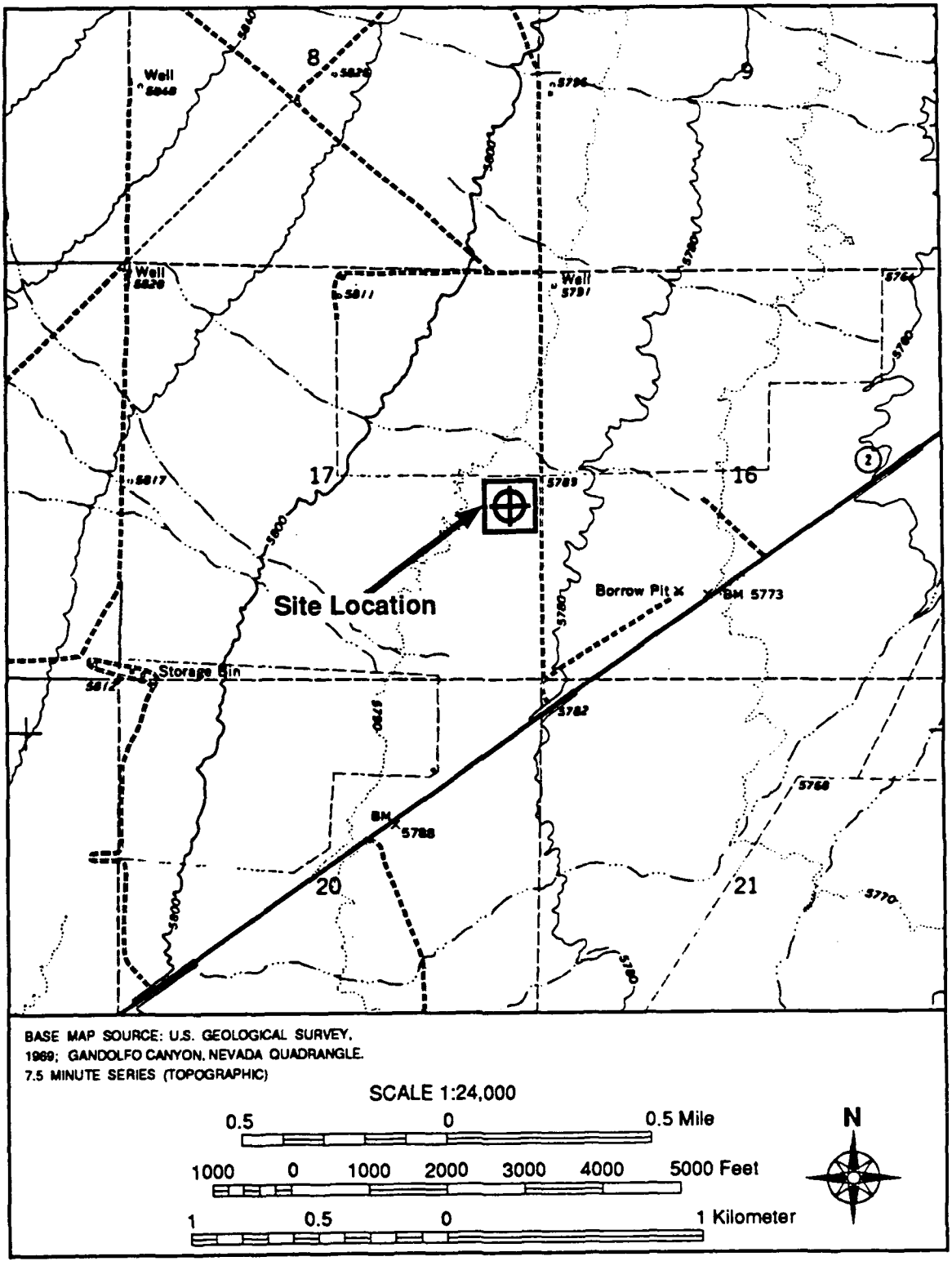


FIGURE B.4 TOPOGRAPHIC SETTING OF THE BLM 2 SITE (CGS-12)

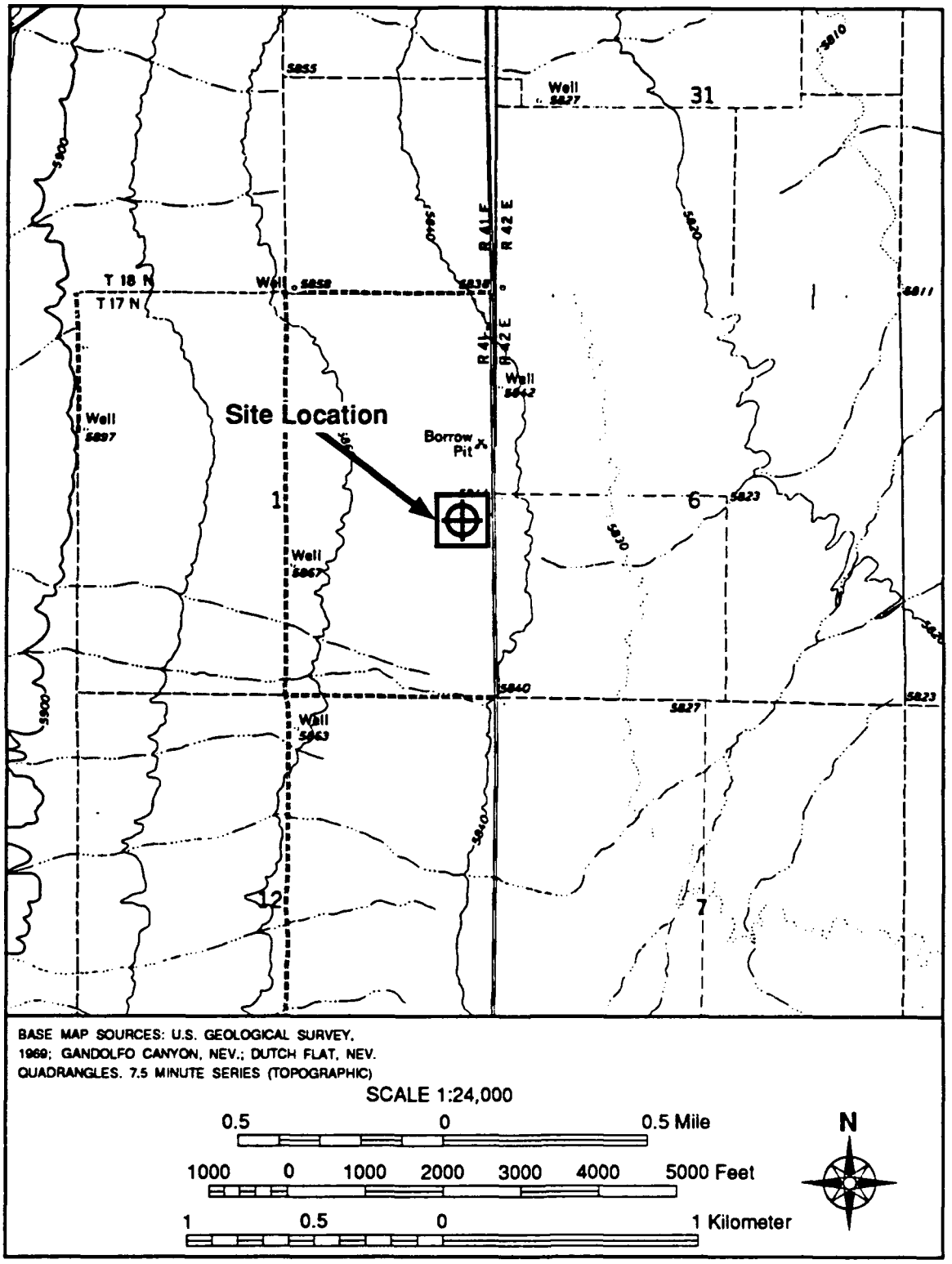


FIGURE B.5 TOPOGRAPHIC SETTING OF THE RENFRO SITE (CGS-15)

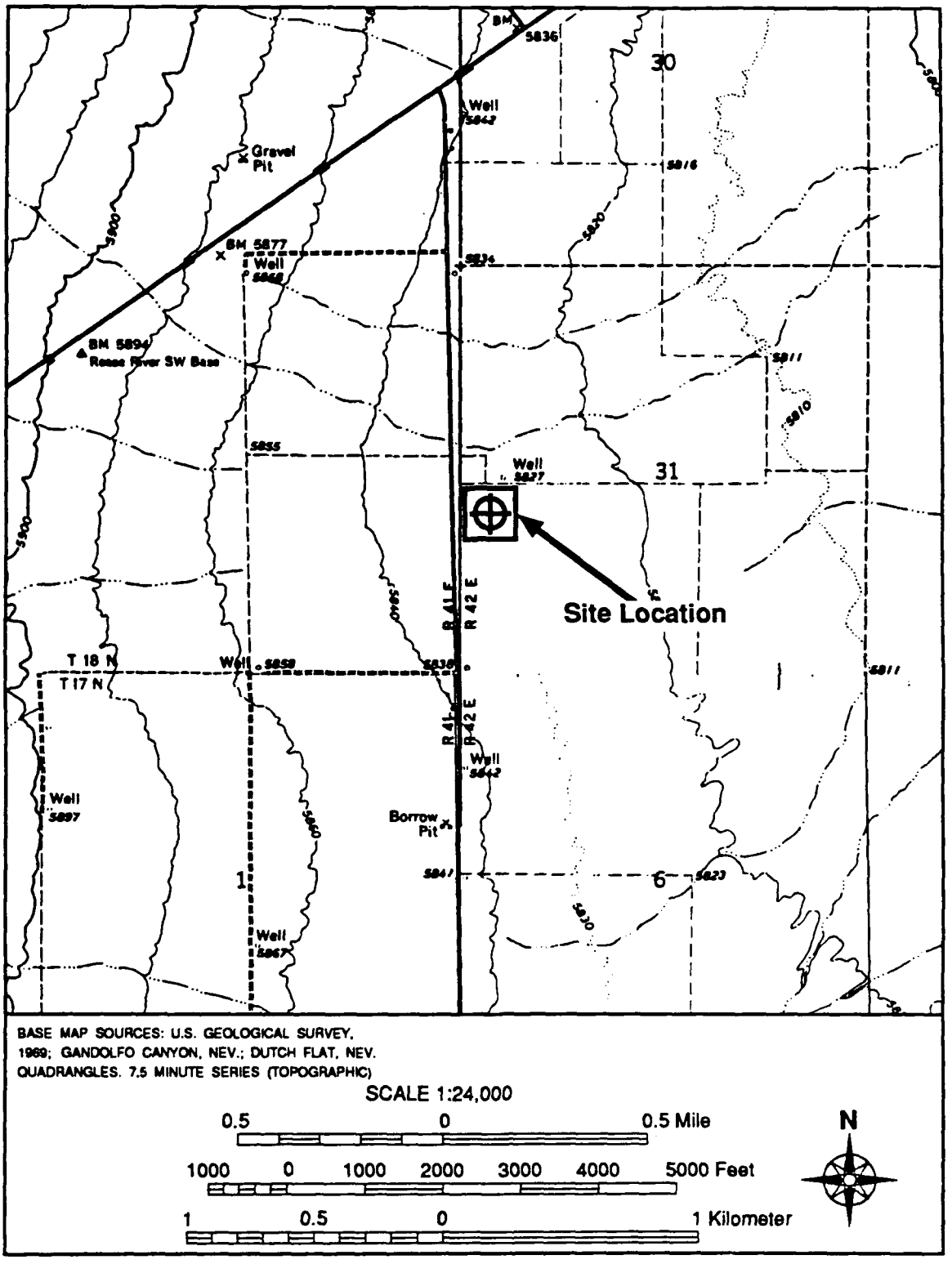


FIGURE B.6 TOPOGRAPHIC SETTING OF THE ROSE SITE (CGS-16)

APPENDIX C

CORRESPONDENCE

CORRESPONDENCE

Appendix C documents contacts with the following federal and state agencies and Native American groups:

Individual	Agency	Date	Response
Robert L. Hallock, Acting Field Supervisor	U.S. Department of the Interior, Fish and Wildlife Service	01-17-90	Attached
David L. Harlow, Field Supervisor	U.S. Department of the Interior, Fish and Wildlife Service	05-02-90 05-27-92 01-13-93	Attached Attached Attached
Alice M. Baldrica, Deputy State Historic Preservation Officer	Department of Conservation and Natural Resources, Division of Historic Preservation and Archeology	02-14-90 07-02-90 08-28-90	Attached Attached Attached
A. Tom, Chairman	TE-Moak Tribes, Elko, Nevada	Letter was sent on 12-16-92, but no response has been received to the letter or several attempts at phone communication.	
D. Gonzales, Tribal Administrator	TE-Moak Tribes of Western Shoshone, Elko, Nevada	Letter was sent on 07-02-90, but no written response has been received. Phone conversations held on 02-19-91 and 02-25-93.	

Individual	Agency	Date Response
G. Holley, Sr. Chairman	Battle Mountain Band of TE-Moak, Battle Mountain, Nevada	Letter was sent on 12-16-92, but no response has been received to the letter or several attempts at phone communication.
G. Healey, Chairman	South Fork Band of TE-Moak, Lee, Nevada	Letter was sent on 12-16-92, but no response has been received to the letter or several attempts at phone communication.
A. McQueen, Chairman	Wells Band of TE-Moak, Wells, Nevada	Letter was sent on 12-16-92, but no response has been received to the letter or several attempts at phone communication.
H. Adkins, Tribal Administrator	Duck Valley Reservation of Shoshone-Paiute, Owyhee, Nevada	Letter was sent on 07-12-90, but no response has been received to the letter or to several attempts at phone communication.
L. Hooper, Chairman	Yomba Tribal Council, Yomba Reservation, Austin, Nevada	Letter was sent on 06-13-90, but no response has been received to the letter or to several attempts at phone communication.

Individual	Agency	Date	Response
D. Crawford, Executive Director	Inter-Tribal Council of Nevada, Reno, Nevada	Letter was sent on 12-16-92,	but no response has been received to the letter or to several attempts at phone communication.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

RENO FIELD STATION
4600 Kietzke Lane, Building C-125
Reno, Nevada 89502-5093

January 17, 1990
File No.: 1-5-90-TA-107

Ms. Jill Buxton
Earth Metrics
2855 Campus Drive
San Mateo, California 94403

Dear Ms. Buxton:

As per your January 16, 1990 telephone conversation with Donna Withers of this office, please find enclosed lists of Nevada's threatened, endangered, proposed and candidate species. We have also included a map depicting known distribution of candidate plants near the project area. We do not have any wetland inventory maps which cover the Reese River valley.

If you have any further questions, please contact Donna Withers at (702) 784-5227.

Sincerely,

Randy M. McKatt

for Robert L. Hallock
Acting Field Supervisor

ESMERALDA COUNTY

None

EUREKA COUNTY

Fishes

T	16Jul75	Lahontan cutthroat trout, Oncorhynchus clarki henshawi

HUMBOLDT COUNTY

Fishes

T	10Dec85	Desert dace, Eremichthys acros
T	16Jul75	Lahontan cutthroat trout, Oncorhynchus clarki henshawi

LANDER COUNTY

~~None~~ Fishes

T	16Jul75	Lahontan cutthroat trout, Oncorhynchus clarki henshawi

LINCOLN COUNTY

~~Birds~~ Bald Eagle

Fishes

T	28Mar85	Big Spring spinedace, Lepidomeda mollispinis pratensis
E	27Sep85	White River springfish, Crenichthys baileyi baileyi
E	27Sep85	Hiko White River springfish, Crenichthys baileyi grandis
E	13Oct70	Pahranagat roundtail chub, Gila robusta jordani

Reptiles

E*	04Aug89	Desert tortoise, Gopherus agassizii

*emergency rule effective through 01Apr90

PE+	13Oct89	Desert tortoise, Gopherus agassizii

+proposed for endangered status

LYON COUNTY

None

MINERAL COUNTY

Fishes

T	31Mar85	Railroad Valley springfish, Crenichthys nevadae
T	16Jul75	Lahontan cutthroat trout, Oncorhynchus clarki henshawi
E	27Sep85	Hiko White River springfish, Crenichthys baileyi grandis

EUREKA COUNTY

Birds

2	Ferruginous hawk, Buteo regalis
2	Long-billed curlew, Numenius americanus

Fishes

2	Fish Creek Springs tui chub, Gila bicolor euchila
2	Diamond Valley speckled dace, Rhinichthys osculus ssp.
2	Lahontan Creek tui chub, Gila bicolor obesa

Plants

2	Crypthantha hoffmannii (Rec. 3B by NNNPS)
3C*	Epilobium nevadense
2	Phacelia nevadensis (Rec. 3B by NNNPS)

HUMBOLDT COUNTY

Mammals

2	North American lynx, Felis lynx canadensis
2	Ferruginous hawk, Buteo regalis
2	Long-billed curlew, Numenius americanus

Fishes

2	Sheldon tui chub, Gila bicolor eurysoma
2	Alvord chub, Gila alvordensis
2	Lahontan tui chub, Gila bicolor obesa

Plants

2	Astragalus solitarius
2	Astragalus yoder-williamsii
3C*	Eriogonum anemophilum
2	Eriogonum crosbyae
2	Mentzelia mollis (Rec. 3C by NNNPS)
2	Oryctes nevadensis
*	Penstemon floribundus
+	Potentilla basaltica

LANDER COUNTY

Birds

2	Long-billed curlew, Numenius americanus

Plants

*	Arabis falcifructa
2	Asclepias eastwoodiana
2	Crypthantha hoffmannii (Rec. 3B by NNNPS)
2	Cymopterus goodrichii
2	Draba arida
3C*	Eriogonum anemophilum
2	Haplopappus alpinus

United States Department of the Interior

FISH AND WILDLIFE SERVICE

RENO FIELD STATION
4600 Kietzke Lane, Building C-125
Reno, Nevada 89502-5093

May 2, 1990
File No.: 1-5-90-SP-208

Robert T. Veale, Major
Deputy Program Manager, GWEN
Department of the Air Force
Headquarters Electronic Systems Division
Hanscom Air Force Base, Massachusetts 01731-5000

Dear Major Veale:

The U.S. Fish and Wildlife Service (Service) has reviewed your April 11, 1990, letter and Preliminary Site Evaluation Report for candidate sites for the Ground Wave Emergency Network (GWEN) relay node in central Nevada. To the best of our knowledge, no federally listed endangered, threatened, proposed, or candidate species are found on or adjacent to the six candidate sites.

Because it has been recently plowed, has little vegetation, has no wetlands or surface water bodies, and is not located within a 100-year floodplain, we recommend the Renfro Site (CGS-15) be given high priority for siting the GWEN facility.

If you have any questions, please contact Mary Jo Elpers at 702/784-5227.

Sincerely,

Randy M. McNatt

for David L. Harlow
Field Supervisor

cc: Nevada Department of Wildlife, Reno and Fallon, NV

BOB MILLER
Governor

STATE OF NEVADA

Ronald M. James
[redacted]
State Historic Preservation Officer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF HISTORIC PRESERVATION AND ARCHEOLOGY
Capitol Complex
Carson City, Nevada 89710
(702) 687-5138

February 14, 1990

Jill Buxton
Earth Metrics Inc.
2855 Campus Drive, Suite 300
San Mateo, California 94403

Dear Ms. Buxton:

This letter is in response to your request for comments on the placement of a radio communications relay mode site near Austin, Nevada as part of the Ground Wave Emergency Network (GWEN) communication system. As discussed with you on the telephone, Austin is an historic district listed on the National Register of Historic Places. (See attached map.) In determining the location of the relay node you should consider whether or not it will be visible within the historic district and whether or not its placement will have an effect on the district.

The Division recommends an archeological/historic survey of any area chosen that has not been previously disturbed nor surveyed. Please coordinate with the appropriate federal agency regarding survey requirements, or with this office, if state or private property is selected.

If you have any questions or wish to discuss this matter further please call us.

Sincerely,

Alice M. Baldrica

Alice M. Baldrica, Deputy
State Historic Preservation Officer

AMB:emt
Enclosure

BOB MILLER
Governor

STATE OF NEVADA

RONALD M. JAMES
State Historic Preservation Officer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF HISTORIC PRESERVATION AND ARCHEOLOGY
123 W. Nye Lane, Room 208
Capitol Complex
Carson City, Nevada 89710
(702) 687-5138

July 2, 1990

Robert Erving
Earth Metrics, Inc.
2855 Campus Drive, Suite 300
San Mateo, CA 94403

Dear Mr. Erving:

This letter is in response to your recent correspondence regarding the construction of a GWEN (Ground Wave Emergency Network) site near Austin, Lander County, Nevada. An archeological consultant conducted an intensive archeological/historic survey of five of six alternative GWEN sites in the project area. Her findings were negative; historic properties were not located.

If the U. S. Air Force selects one of the five sites examined as part of this survey effort, further efforts to identify historic properties will not be recommended. The Air Force should notify us officially of its selection. Please note that your consulting firm cannot make determinations of eligibility or effect; only the Air Force or another federal agency may do so. Additionally, if the selected site is located on land managed by the Bureau of Land Management, the Air Force should coordinate with that agency regarding compliance related matters, including Section 106.

If you have any questions regarding these comments, please call us.

Sincerely,

Alice M Baldrica

ALICE M. BALDRICA, Deputy
State Historic Preservation Officer

cc: Dr. Robert McGonagle, Battle Mountain District, BLM

BOB MILLER
Governor

STATE OF NEVADA

RONALD M. JAMES
State Historic Preservation Officer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF HISTORIC PRESERVATION AND ARCHEOLOGY
123 W. Nye Lane, Room 208
Capitol Complex
Carson City, Nevada 89710
(702) 687-5138

August 28, 1990

Lt. Col. Stephen T. Martin, USAF
Program Manager, GWEN
Department of the Air Force
Headquarters Electronic Systems Division (AFSC)
Hanscom Air Force Base, MA 01731-5000

Dear Lt. Col. Martin:

This letter is in response to your request for comments on the placement of a Ground Wave Emergency Network (GWEN) node near Austin, Nevada. We've reviewed a cultural resources report (BLM CRR 6-1354p) prepared following an intensive archeological/historic survey of five candidate sites in the Reese River Valley. We've also reviewed information on historic resources that might lie within the area of potential effect.

You have determined that historic properties do not exist in the area of potential effect identified and that the construction of a GWEN relay node will have no effect on properties of National Register quality. I concur with your findings.

I have no other comments on the proposed action unless the Air Force selects a site other than one of the five examined for construction of the node.

Sincerely,

Alice M. Baldrica

ALICE M. BALDRICA, Deputy
State Historic Preservation Officer
/AMB

United States Department of the Interior

FISH AND WILDLIFE SERVICE
FISH AND WILDLIFE ENHANCEMENT
RENO FIELD OFFICE
4600 Kietzke Lane, Building C-125
Reno, Nevada 89502-5093

May 27, 1992

File No.: 1-5-92-SP-211
1-5-92-SP-229
1-5-92-SP-230

Lt. Col. Stephen T. Martin
Program Manager, GWEN
Department of the Air Force
Hanscom Air Force Base, Massachusetts 01731

Dear Lt. Col. Martin:

Subject: Species List for the Proposed Ground Wave Emergency Network (GWEN) Project in Northeastern Nevada

As requested by your letter dated April 23, 1992, we have attached a list of the threatened and endangered species that may be present in the subject project area (Attachment A). To the best of our knowledge, no proposed species occur within the area. This list fulfills the requirement of the Fish and Wildlife Service (Service) to provide a species list pursuant to section 7(c) of the Endangered Species Act of 1973, as amended (Act). Please reference the species list file number shown on Attachment A in all subsequent correspondence. A list of published references dealing with the distribution, life history, and habitat requirements of the listed species is also attached (Attachment C). This information may be helpful in preparing the biological assessment for this project, if one is required. Please see Attachment B for a discussion of the responsibilities Federal agencies have under section 7(c) of the Act and the conditions under which a biological assessment must be prepared by the lead Federal agency or its designated non-Federal representative.

If you determine that a listed species may be affected by the proposed project, you should initiate consultation pursuant to 50 CFR § 402.14. Informal consultation may be utilized prior to a written request for formal consultation to exchange information and resolve conflicts with respect to a listed species. If a biological assessment is required, and it is not initiated within 90 days of your receipt of this letter, you should informally verify the accuracy of this list with our office. If, through informal consultation or development of a biological assessment, or both, you determine that the proposed action is not likely to adversely affect the listed species, and the Service concurs in writing, then the consultation process is terminated and formal consultation is not required.

Lt. Col. Stephen T. Martin

Also, for your consideration, we have included a list of the candidate species that may be present in the project area (Attachment A). These species are currently being reviewed by the Service and are under consideration for possible listing as endangered or threatened. Candidate species have no protection under the Act, but are included for your consideration as it is possible that one or more of these candidates could be proposed and listed before the subject project is completed. Should the biological assessment reveal that candidate species may be adversely affected, you may wish to contact our office for technical assistance. One of the potential benefits from such technical assistance is that, by exploring alternatives early in the planning process, it may be possible to avoid conflicts that could otherwise develop, should a candidate species become listed before the project is completed.

Please contact Robin Hamlin at (702) 784-5227 if you have any questions regarding the attached list or your responsibilities under the Act.

Sincerely,

David L. Harlow
Field Supervisor

Attachments

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES THAT MAY OCCUR IN THE AREA OF THE PROPOSED

GWEN Project near Reese River Valley, Nevada

File Number: 1-5-92-SP-230

Candidate Species

Mammals	
2 pygmy rabbit	*Brachylagus idahoensis*
2 spotted bat	*Euderma maculatum*
Birds	
2 northern goshawk	*Accipiter gentilis*
2 ferruginous hawk	*Buteo regalis*
2 black tern	*Chlidonias niger*
2 western least bittern	*Ixobrychus exilis hesperis*
2 loggerhead shrike	*Lanius ludovicianus*
2 mountain quail	*Oreortyx pictus*
2 white-faced ibis	*Plegadis chihi*
Amphibians	
2 spotted frog	*Rana pretoisa*
Plants	
2 Eastwood's milkweed	*Asclepias eastwoodiana*

(2)--Category 2: Taxa for which existing information indicated may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

United States Department
of the Interior
Fish and Wildlife Service
Reno Field Station
Attn: Mr David L. Harlow
4600 Kietzke Lane, Building C-125
Reno, NV 89502-5093

RE: U.S. Air Force Ground Wave Emergency Network (GWEN) Project in Central Nevada

---

This is to verify that no changes have been made to the list of federally-designated threatened, endangered, or candidate species sent on May 27, 1992.

David L. Harlow _____ Date _____

Changes have been made to the list of federally-designated threatened, endangered, or candidate species since our correspondence to you on May 27, 1992. Enclosed is a new list of species.

David L. Harlow Jan 13 1993
Date

United States Department of the Interior

FISH AND WILDLIFE SERVICE
FISH AND WILDLIFE ENHANCEMENT
RENO FIELD OFFICE
4600 Kietzke Lane, Building C-125
Reno, Nevada 89502-5093

January 13, 1993
File No. 1-5-92-SP-211-AMD
1-5-92-SP-229-AMD
1-5-92-SP-230-AMD

Lt. Col. Stephen T. Martin
Program Manager, GWEN
Department of the Air Force
Hanscom AFB, Massachusetts 01731

Dear Lt. Col. Martin:

Subject: Species List for the Proposed Ground Wave Emergency Network (GWEN) Project in Nevada

This responds to your letter dated December 17, 1992, requesting an updated list of threatened and endangered species that may be present within the subject project area. Enclosed are amended lists for the proposed Tuscarora, Lathrop Wells, and Reese River Valley project sites in Nevada.

Please contact Robin Hamlin at (702) 784-5227 if you have any questions regarding the enclosed list or your responsibilities under the Act.

Sincerely,

David L. Harlow
Field Supervisor

Enclosures

cc:
SRI International, Menlo Park, California (Attn: Louise Forbush)

CANDIDATE SPECIES THAT MAY OCCUR IN THE AREA OF THE PROPOSED

GWEN Project near Reese River Valley, Nevada

File Number: 1-5-92-SP-230 AMD

Candidate Species

Mammals		
2	pygmy rabbit	*Brachylagus idahoensis*
2	spotted bat	*Euderma maculatum*
Birds		
2	northern goshawk	*Accipiter gentilis*
2	ferruginous hawk	*Buteo regalis*
2	black tern	*Chlidonias niger*
2	western least bittern	*Ixobrychus exilis hesperis*
2	loggerhead shrike	*Lanius ludovicianus*
2	mountain quail	*Oreortyx pictus*
2	white-faced ibis	*Plegadis chihi*
Amphibians		
2	spotted frog	*Rana pretiosa*
Plants		
2	Eastwood's milkweed	*Asclepias eastwoodiana*
2	Elko rock-cress	*Arabis falcifructa*
2	Goodrich biscuitroot	*Cymopterus goodrichii*
2	desert whitlowgrass	*Draba arida*

(2)--Category 2: Taxa for which existing information indicates may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

APPENDIX D

GLOSSARY

GLOSSARY

Abbreviations and Units of Measure

AM	Amplitude modulation
ATU	Antenna tuning unit
BIA	Bureau of Indian Affairs
BLS	Bureau of Labor Statistics
BUPG	Back-up power group
CGS	Candidate GWEN site
CRP	Conservation Reserve Program; a 10-year program whereby farmland is not cultivated to prevent erosion
dBA	Decibels on the A-weighted scale, which is a measure of the intensity of the sounds people can hear
DEP	Division of Environmental Protection, Nevada State Department of Conservation and Natural Resources
DRI	Desert Research Institute
DWR	Division of Water Resources, Nevada State Department of Conservation and Natural Resources
EA	Environmental Assessment

EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement; in this document, the term refers to the FEIS for the GWEN Final Operational Capability that was released in September 1987 by the U.S. Air Force, Electronic Systems Division, Hanscom Air Force Base, Massachusetts
FIA	Federal Insurance Administration, United States Department of Housing and Urban Development
FOC	Final Operational Capability, the third phase of development of GWEN
FONSI	Finding of No Significant Impact
GACC	Greater Austin Chamber of Commerce
GPO	Government Printing Office
GWEN	Ground Wave Emergency Network
HEMP	High-altitude electromagnetic pulse
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning, the formal review process for the EA
kHz	Kilohertz
LF	Low frequency

mg/l	Milligrams per liter (1 mg/l = 1 ppm)
MM	Modified Mercalli, a scale of the severity of earthquake effects
MSL	Mean sea level
µg/l	Micrograms per liter (1 µg/l = 1 ppb)
NDOT	Nevada Department of Transportation
NPDC	National Planning Data Corporation
NRC	National Research Council, the principle operating agency of the National Academy of Sciences and the National Academy of Engineering
NRHP	National Register of Historic Places
PAWS	Potential areawide sites; the portion(s) of an SSA left after application of those siting criteria that do not require a field survey, such as the location of national and state parks
PCGS	Potential candidate GWEN site; any site that is identified from roadside surveys as suitable for further investigation
PGS	Preferred GWEN site; the CGS identified by the Government that represents the Government's preferred location for a relay tower
PSER	Preliminary Site Evaluation Report

ROE	Right-of-entry
SCS	Soil Conservation Service
SHPO	State Historic Preservation Officer; the person responsible for administering the National Historic Preservation Act at the state level, reviewing National Register of Historic Places nominations, maintaining data on historic properties that have been identified but not yet nominated, and consulting with federal agencies concerning the impacts of proposed projects on known and unknown cultural resources
SSA	Site search area; the 250-square-mile area within which four to six CGSs are identified; the SSA is the area within a 9-mile radius of a set of nominal coordinates in the network design. It is used as a manageable range in which to conduct siting investigations.
TLCC	Thin Line Connectivity Capability; the second phase of development of GWEN
UHF	Ultrahigh frequency (band); specifically 300 to 3,000 megahertz
USAF	United States Air Force
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

VMC	Visual Modification Class

Definitions

Air pollutant	An atmospheric contaminant, particularly the 15 atmospheric contaminants specified in federal and most state regulations
Alluvial	Describes material, such as sand, silt, or clay, that was deposited on land by streams; alluvial soils with an alluvium base are susceptible to shifting or liquefaction during earthquakes
Archaeological survey	A survey conducted by a trained archaeologist that is designed to test for the presence or absence of archaeological resources; it involves walking an area at predetermined intervals and may involve digging small shovel pits if ground visibility is low
Block faulting	Faults that separate the earth's crust into blocks that tend to move independently of one another; the result of block faulting can be seen in a mountain range where the upturned edge of a block of the earth's crust forms the range, the faulted edge forms a steep scarp, and the tilted back of the block forms a long and relatively gentle declivity that merges imperceptibly into a bordering plain
Candela	A unit of measure of the intensity of light equal to the brightness of one candle
Chalcedony	A translucent quartz that is commonly pale blue or gray with nearly wax-like luster
Chert	Flint-like rock composed of chalcedony with variable amounts of clay and other impurities; commonly selected as a raw material for flaked-stone tools

Class III archaeological survey	A subset of a Phase I archaeological survey which includes a literature search and a sample survey
Core	A cobble or smaller rock from which flakes or blades are removed; the core may be used as a tool as well as a source of flakes
Cultural resource	Prehistoric, Native American, and historic sites, districts, buildings, structures, objects, and any other physical evidence of past human activity
Evaluative criteria	Applied to portions of a potential siting area for a GWEN facility to determine its suitability. Areas that rank low against evaluative criteria may be excluded from consideration, or given a low priority in the site selection process
Exclusionary criteria	Criteria used to eliminate or exclude highly sensitive areas or areas that do not meet the limits of acceptable performance from consideration for GWEN facilities
Federal jurisdictional wetland	As defined in the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (GPO 1989-236-985/00336), a wetland is a class of habitats distinguished by the presence of saturation to the surface or standing water during at least 1 week of the growing season (wetland hydrology), a soil type characteristic of saturated or poorly drained conditions (hydric soils), and the predominance of plants that only or mostly occur on wet sites (hydrophytic vegetation)
Flake	A fragment of rock intentionally removed from a core by percussion or pressure flaking; it usually bears a bulb of percussion, ripples, and a striking platform

Floodplain	Land adjacent to a river that is commonly covered by water during high flow periods
Ground plane	A part of the antenna system consisting of buried copper wires that extend radially from the base of a GWEN tower for a distance of approximately 330 feet
Historic properties	For the purposes of this EA, historic properties are those aboveground structures and resources that are listed or eligible for listing on the National Register of Historic Places
Holocene	Geologic designation for the post-glaciation period; the last 10,000 years
Limy	A soil condition of high lime content
Liquefaction	The loss of ground strength by silty and sandy deposits during an earthquake due to seismic vibrations
Modified Mercalli scale	A measure of the intensity of seismic activity based on human perception of the event and potential for damage; the intensity is rated on a Roman numeral scale ranging from I to XII. An earthquake of MM intensity I would be detectable only by seismographs; MM intensity V would shake buildings, break dishes and glassware, and cause unstable objects to fall; MM intensity X would destroy most masonry and frame structures, bend railroad rails slightly, and cause tidal waves and landslides; MM intensity XII would cause nearly total destruction of all buildings. Another commonly used seismic intensity scale, based on readings from a seismograph, is the Richter scale, which was developed in 1935. The Modified Mercalli scale is often used when the historic period to be covered includes data prior to 1935

Paleonto-logical	Pertaining to fossils or the study of fossils
pH	A measure of acidity in which the lower the number, the more acid the substance; 7 represents neutrality
Phase I survey	A survey designed to identify properties that are listed, eligible, or potentially eligible for listing on the National Register of Historic Places within the area that would be affected by the proposed project
Prime farmland	Land that contains soils having high crop production either naturally or through modification; the U.S. Soil Conservation Service is responsible for designating prime farmland
Quarternary	The geologic period of time extending from 2 million years ago to the present
Rain shadow	As air flows down the slopes of a mountain range it is compressed and warmed, allowing minimal precipitation on the valley floor
Scarp	A line of cliffs produced by faulting or erosion
Sedimentary rock	Rock formed by the consolidation or cementation of particles deposited by water or wind
Tertiary	The geologic period from 65 to 2 million years ago
Top-loading element	Portions of the antenna that extend diagonally from the top of the tower, which strengthen the signal and provide additional structural support like guy wires